DRAFT
ENVIRONMENTAL ASSESSMENT

ROSEAU, MINNESOTA
FLOOD DAMAGE REDUCTION PROJECT
ROSEAU RIVER

February 2006

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INTRODUCTION

The St. Paul District, Corps of Engineers, has prepared this assessment of the environmental effects that may result from the proposed construction of flood protection measures at Roseau, Minnesota. This assessment of the Corps of Engineers proposal is required by the National Environmental Policy Act of 1969 (NEPA), the Council on Environmental Quality Regulations (40 CFR 1500-1508), and the Corps of Engineers regulation ER 200-2-2.

I. PROJECT AUTHORITY

The authorization for the planning and design of the proposed actions was given in a 30 September 1974 Resolution of the Senate Committee on Public Works which requested that the Corps of Engineers investigate among other areas, flood control within the basin of the Red River of the North. The Roseau River is a sub-basin of the Red River. Previous NEPA documents prepared on activities in the proposed project area include:

A. Hay Creek Section 206 – Ecosystem Restoration Report/Environmental Assessment; November 2003.
B. Environmental Impact Study of Flood Control Impoundments in Northwestern Minnesota – Environmental Impact Study; July 1996.
C. West Interceptor - Roseau County; In Preparation

II. PROJECT LOCATION

Roseau, Minnesota, is located in northwest Minnesota, approximately 220 miles northwest of Duluth, Minnesota, 80 miles northeast of Grand Forks, North Dakota, and 10 miles from the Canadian border (Plate 1). The area is located on the boundary between the flat prairie region of northwestern Minnesota and the boreal forest region of north central Minnesota. The specific project area runs from a point on the Roseau River south of the City of Roseau along a corridor on the east side of the river to a point north of town where the project rejoins the Roseau River (Plate 2).

III. PURPOSE AND NEED FOR THE PROPOSED ACTION

The proposed action is necessary because the existing conditions subject the town of Roseau to

flooding from high stages on the Roseau River. The community experienced flooding in the years 1996, 1985, 1979, 1968 and 1950 in addition to catastrophic flooding following a storm event in June 2002. During this event, up to 14 inches of rain fell on the community and surrounding areas. By midday on June 9, the Roseau River, which runs through the community, was 2.5 feet above flood stage. During the afternoon of the 10th, a dike running along the Roseau River broke, and water entered much of the downtown and adjacent residential areas of Roseau. On the evening of the 12th, the river crested 7.5 feet above flood stage. Surveys found that approximately 150 (over 80 percent) of the commercial and public buildings had direct flood damage and were closed for over 10 days. More than 800 of the approximately 995 residential structures received direct flood damage to their basement and/or first floor living areas. The proposed action is intended to provide protection for the community against future events.

IV. PROPOSED ACTION

The proposed action to provide the community with flood protection consists of the following components (Plate 2). The National Economic Development (NED) plan is the 150' wide east diversion. The local sponsor indicated that downstream stage increases were unacceptable from a local perspective and requested that storage areas be added to alleviate those stage increases. The plan containing the storage areas is the locally preferred plan. The following is a description of the plan components; all components are included in the NED plan except the off-channel storage areas.

A. Diversion Channel

The principal component of the proposed action would be a 4.5-mile long diversion channel running parallel and to the east of the Roseau River. The diversion channel would split from the river south of the city at the City Park. After passing along the eastern border of the city, the water would reenter the river at a point just upstream from the confluence of the river and Hay Creek. The entrance to the channel would be set at an elevation of 1042.0 feet. This is roughly equivalent to the existing water surface profile of a two-year frequency event and is the channel forming discharge for the river. The location of the entrance to the proposed diversion channel would be along the riverbank adjacent to the City Park. The upstream reach of the channel would pass through the park. The channel would have a bottom width of 150-feet and 1V: 5H side slopes (Plate 3). The channel invert would drop approximately 1 foot on a slope of 0.000256 from the channel entrance to the railroad bridge, located approximately one mile down the diversion channel. The channel bottom would be horizontal from this location to the point where it begins a descent toward the confluence with the Roseau River, a distance of about 1000 feet.

The channel would be formed by excavating into the existing topography. Upstream of Highway 11, the channel would be cut as much as 16 feet below the existing ground. From Highway 11 north, the channel cut would become increasingly shallow as the channel invert elevation approaches the land surface elevations. The bottom width of the channel would be a constant 150-feet but the top width would vary between 300 and 150-feet wide depending on the elevation of the adjacent land areas. In the reaches of the diversion corridor north of Highway 11, the flow would transition from flow in a channel to overland floodplain flow. In this section

of the corridor the flow would be confined within a floodplain corridor by diversion levees described below. Just downstream of the northern end of the wastewater treatment plant, the confined channel would disappear and the water would be free to spread across the terrain. On the northern edge of this area, adjacent to the Roseau River, a sloped (0.01V: 1.0H), 150-foot wide, 1,000-foot long, grass-lined channel would be constructed, to allow the water from the diversion channel to re-enter the river. The channel dimensions for this segment are 1V: 3.5H side slopes with a bottom width of 150 feet. Surplus material excavated in the construction of the diversion channel would be spread on adjacent farm fields at the southern (upstream) end of the diversion. Approximately 120 acres covered to a depth of 4.5 feet would be needed to dispose of the material, which would be shaped and vegetated to accommodate recreation activities, among others.

Approximately nine-miles of diversion levees would be constructed to the east and west of the diversion channel to insure containment of the diversion flows. The levees would be ten-feet wide at the top and have 1V: 3H side slope (Plate 4) and would cover 48 acres including 11 acres of road raises. The levee east of the diversion channel would insure that properties to the east would not be adversely affected by the project. The east diversion levee would extend to the north and east from Highway 11. The first segment would end at County Road 28, which ties in to high ground to the south. The second segment of levee would begin near the airport a mile to the east. This levee encompasses the largest of the storage cells (see below). The levee would extend north along Township Road 338, then west for one mile and then north again. This portion of the levee would block the diversion flows from entering Hay Creek. The levee would end at the Roseau River just downstream of the confluence with Hay Creek.

The levee west of the diversion channel would prevent the water in the channel from flowing back toward the main river channel north of the city. The presence of the diversion levee would maintain the flow parallel to the river within the floodway. The west diversion levee also would prevent diversion flows from backing into town. The west diversion levee begins near Highway 11 and continues generally to the north until in ends at the high ground above the Roseau River bank about one river mile upstream of the confluence with Hay Creek. The area between the east and west diversion levees encompasses the diversion corridor as well as the storage cells (see below).

Along the length of the diversion channel and levees, there are three wooded areas. Trees within the footprint of these structures would be removed. Upon completion of construction, these areas would be seeded with native grasses. Trees would be planted at various locations along the floodway and buffer areas outside of the channels. A substantial amount of the storage and floodway area could be managed for environmental enhancement purposes. Local, State and Federal natural resource agencies would be coordinated with in future project design phases to determine the preferred vegetative species and management practices to use.

Bridges are also proposed to cross the diversion channel at County Road 24, the railroad tracks, and Highway 11. Abutments of these bridges will be armored with rock. Downstream of Highway 11, a Texas crossing with box culverts would be installed. This would not interrupt flow in the area nor change the post-construction land use. Two roads will be used as is, or slightly raised, as levees for the storage areas. Minimal changes in structure or size would be

expected. Highway traffic bypass during construction would be handled with detours rather than construction.

B. River Restriction Bridge

In order to reduce the size of the diversion channel and add additional protection to the downstream community, a restriction bridge would be constructed just downstream from the entrance to the diversion channel (Plate 5). This restriction would raise the water in the channel thereby increasing the energy available to drive water through the diversion channel. The proposed structure would be similar to a roadway bridge abutment with a 16-foot wide bridge deck. The flanks of the restriction would extend across the valley at elevation 1053.5. The gap left by the opening would have a width of 100 feet and a bottom elevation of 1030.0. The structure would not begin to affect existing flow conditions until approximately the five-year flood event. The head losses at the structure for various year events are presented below.

Head Loss at River Restriction Bridge

Year Event	2- Year	5-Year	10-Year	20-Year	50-Year	100-Year
Head loss	0.01 ft	0.02 ft	0.10 ft	0.17 ft	0.27 ft	0.38 ft

Rock protection would be placed in the existing river channel from just upstream of the structure to approximately 50-feet downstream from the structure. Sufficient existing substrate material would be removed to allow for the placement of the rock riprap protection while still maintaining the existing river bathymetry. The resulting river stages upstream of the entrance to the diversion channel for any flow would be less than existing conditions because of the water being diverted into the diversion channel.

C. Off-Channel Storage Areas

The presence of the diversion channel alone would slightly increase the hydrograph of the Roseau River during high flood events downstream of the confluence of the channel and river. In order to maintain the existing hydrograph, as the local sponsor requested, additional storage/ponding areas have been added to the alternative plan. The storage areas would be located on either side of the 1000-foot wide diversion corridor north of Highway 11. These storage areas would be inside the main levees described above but isolated from the diversion channel by an additional set of lower, intermediate levees. Land within the storage levees would remain dry for events with less discharge than the 20-year event. Events that exceed the 20-year event would reach the height of an earthen, rock protected, spillway at the upstream end of the storage levee and a portion of the flow would spill into the storage areas. This water would collect in the levee bound areas until river stages had receded enough so that the water could be released through rock-protected control structures in the levees. The peak stage downstream of the project would be unchanged with the addition of storage cells.

D. Maintenance of West Bank Flows

The East Diversion alternative would reduce stages in the main channel of the Roseau River. Analysis was done on the flows on the West Bank in order to insure that this reduction would not

have an adverse affect on the flow distribution and breakout flows on this side of the river. One problem location was identified where a driveway would act as a weir controlling a breakout from the west bank, north of town. The driveway elevation would be lowered 0.6 feet, commensurate with the anticipated stage reduction, to maintain existing over land flow conditions on the west side of the river.

E. Non-structural Measures

It has been determined that non-structural measures will not be needed as part of the recommended project.

F. Recreational Enhancement

Plans for a system of recreational trails that could be incorporated into the flood control components have been developed (Plate 6). The proposed system would consist of the following three types of trails.

1. Multi-Purpose - Three-pedestrian/ bicycle multi-purpose (MP) trail loops would be constructed with a combined length of about 7-miles. The MP trails would be eight-feet wide, made of compacted gravel or asphalt, and be situated on the west bank of the diversion channel then crossing over to the east side of the diversion traveling north and looping back down to the west bank. This has been designed as an interlocking trail system that would provide varying distances and experiences to the users. The south trail will be a 2-mile segment from the river structure to Highway 11, with an asphalt surface. A high overlook will illustrate the entire project on this leg. The north trail will be a 2½ mile elevated prairie trail sited on the levee, extending from Highway 11 to the river north of town. A 2½ mile wildlife interpretive trail loop will connect to the north trail and wind along the river to the channel outlet, tying into the eastern-most levee and connecting back to the main trail, winding through areas containing plantings of trees and native species of groundcover . The wildlife trail's riverbank segment will provide scenic overlooks, interpretive areas, and birding stations. The north and south loops (main trail), using the project control structure as a river crossing on the south end and the project levee on the north, would connect to existing or planned urban trail segments constructed by the city which are located on the west side of the river.

2. Canoe - A canoe trail would connect the upstream and downstream ends of the project. The canoe feature would consist of two small gravel parking lots; two launch structures, two retrieval structures, and a short portage trail. This recreation trail would have a north segment of about 1.5 miles and a south segment of about 3 miles with parking at either end. These segments would connect via a short portage in town, which is necessitated by the dam. The city could provide a parking area to support the portage along with improving access to the river for fishers and sightseers.

3. Off Road Vehicle Trails - Two 12-feet wide, compacted off-road vehicle trails (ORV) would be constructed. They would be suitable for all-terrain-vehicles (ATV), dirt bikes, motocross, and snowmobiles and would function all year. For safety, they would be physically

separated from multi-purpose trails. Support facilities for the ORV trails include a trailhead east of the city park where rest rooms, potable water, picnic facilities, and parking are planned. Part of the ORV trails will be a challenge trail; this trail will be constructed using excess excavated material and creative designs for spoil placement. These trails would be constructed to incorporate challenges and difficulties into trail topography that are not usually available in the flat terrain of this region. These trails would be constructed to connect with ORV trails mentioned previously but be removed from the area of the diversion channel, within the project corridor.

V. AFFECTED ENVIRONMENT

A. Socioeconomic Resources

The proposed project area is located in the city of Roseau, Roseau County, in northwestern Minnesota. Roseau is the county seat for Roseau County and serves as a strong retail trade center for the region. Roseau is the largest city within Roseau County, with a market area of over 60 miles. This market area encompasses all of Roseau County, Lake of the Woods County and portions of Marshall, Kittson, Pennington, and Beltrami Counties in Minnesota and southeastern Manitoba, Canada.

It is approximately 360 miles northwest of Minneapolis/St. Paul, Minnesota, and 220 miles west/northwest of Duluth, Minnesota. It is located just 10 miles from the Canadian border, 65 miles east of the North Dakota border, and 21 miles west of Lake of the Woods at the junction of State Highways 11, 89, and 310. The city comprises an area of approximately 170 acres.

The city of Roseau, occupying what once was the bottom of glacial Lake Agassiz, has a relatively flat topography, sloping gently to the north. The city has a topographic relief of approximately 20 feet, with elevations varying from 1055 to 1035 feet.

The 2000 population of Roseau was 2,756, an increase of 15.0 percent from 1990. Roseau County's 2000 population totaled 16,338, an increase of 8.7 percent from 1990. Roseau County's 2000 population is equivalent to only 9.8 persons per square mile, compared to the statewide and nationwide densities of 61.8 and 79.6 persons per square mile, respectively.

POPULATION

Area	*1960 Census*	*1970 Census*	*1980 Census*	*1990 Census*	*2000 Census*
City	2,146	2,552	2,272	2,396	2,756
County	12,154	11,569	12,580	15,026	16,338

The city of Roseau's population has a median age of 37.9 years, with 26.3 percent of the population under the age of 18 and 20.7 percent of the population aged 62 years and over.

Among persons 25 years and over, 81.2 percent of Roseau's population has achieved high school or higher educational attainment compared to 82.5 percent for Roseau County, and 87.9 percent for the State of Minnesota. Approximately 22.8 percent of the adults 25 years and over possess

bachelor's degrees or higher, compared with 14.9 percent for Roseau County, and 27.4 percent for the State of Minnesota.

The Roseau Community School has an enrollment of approximately 1,500 students from kindergarten through grade 12. While there is no institution of post-secondary education in Roseau, Bemidji State University is located 120 miles away in Bemidji, Minnesota. Northland Community and Technical College is located 63 miles away in Thief River Falls, Minnesota.

According to 2000 census figures, there are a total of 1,229 housing units in Roseau. There were 821 owner-occupied (66.8 percent), 336 renter-occupied (27.3 percent), and 72 (5.9 percent) vacant housing units. The median value of owner-occupied housing units is $78,000 and the median monthly rent for renter-occupied housing units is $477.

Roseau County's labor force totaled 10,699 in March 2005, with an unemployment rate of 5.5 percent, compared to 5.0 percent (unadjusted) for the State of Minnesota and 5.4 percent (unadjusted) for the United States.

Employment in Roseau County is dominated by manufacturing, which accounts for 44.3 percent of total employment, compared to 16.3 percent Statewide. Major manufacturers include Polaris Industries (city of Roseau) and Marvin Windows (city of Warroad). The presence of these companies accounts for the county's population growth in recent years. Other significant industries in Roseau County are educational, health, and social services (16.8 percent of employed persons) and retail trade (9.2 percent). Roseau is also home to a strong agricultural community. The chief agricultural enterprise in the region is the production of grass seed. Roseau County provides 80 percent of the Timothy and 15 percent of the Kentucky Bluegrass marketed in the United States. The diversified land with its ample rainfall and good soil also yields abundant wheat, oats, barley, canola, sunflower, and flax crops. Polaris Industries, with 2,100 employees, is Roseau's largest employer. Roseau Public Schools follows it with 190 employees and Roseau Area Hospital with 165 employees.

According to information from the U.S. Census Bureau, the 1999 median household income for Roseau County was $39,852, compared to $47,111 for the State of Minnesota and $41,994 for the United States. In Roseau County, 6.6 percent of the population is below the poverty level, compared to 7.9 percent for the State of Minnesota and 12.4 percent for the United States. According to 2000 census figures, per capita income for Roseau was $18,371, compared to $23,198 for the State of Minnesota and $21,587 for the United States.

Major highways in the City include Highways 89, 310 and Highway 11, which goes east west through the City. The City is served by the Minnesota Northern Railroad, which provides weekly rail freight service to the industrial areas of the City, and by three truck lines. The Roseau airport, located to the east of the City, has a 4,400-foot long paved runway. The closest regional airport is located 63 miles southwest of Roseau in Thief River Falls with daily commercial flights available to Minneapolis/St. Paul International Airport.

Roseau is governed by a council composed of the Mayor and four council members, who are responsible for the operation of City government. They adopt budgets, policies and ordinances,

which are carried out by 5 Council-appointed City Department Heads. The 5-member Council is elected at-large from the city of Roseau with the Mayor serving a 2-year term and each Council member serving 4 years with 2 Council members elected every two years. The city's budget is approximately $4,200,000. The city of Roseau has a Moody's bond rating of BAA3.

B. Recreation

Roseau offers a wide variety of parks and recreational facilities for all ages. The area features include: an 18-hole championship golf course; two indoor artificial ice arenas, one enclosed natural ice arena, and two recreational ice rinks; six tennis courts; eleven ball fields; municipal auditorium; Roseau County Museum & assembly room; senior citizens' center; and a 37-acre city park (including campground, sand volleyball courts, boat launch, fishing pier, playground equipment, and picnic area).

The City of Roseau has few passive or family oriented recreation resources of the types offered by the proposed recreation features of the project. Outdoor public recreation opportunities within the city proper include:

- Roseau City Park – The 37-acre park is located on the south side of the city on the east bank of the river. Facilities at the park include a small playground, rest rooms, showers, picnic facilities, open space, parking, and the DNR boat ramp. The south end of the park has 10-RV camping spaces with water and electrical hook-ups and 10-tent sites. The park provides views and access to the Roseau River. The southern end of the park consists of a fifteen-acre woodlot of mixed hardwoods and conifers.
- North Star or Bjorkman Park is located in the SW part of town and provides quiet green space for neighborhood residents.
- Westside Park provides a playground and basketball courts for users.
- Mothers Park provides quiet green space and flower gardens for the neighborhood.
- The small Veterans Memorial Park serves the downtown, providing open green space, views of the river, and a veteran's memorial.
- Several indoor arenas provide playing areas and spectator facilities for team sports events, especially hockey.
- Fishing on the river. Anglers on the Roseau commonly catch walleye, sauger, northern pike, freshwater drum, and catfish but public access to the river is limited and difficult.

Regional recreation resources include:

- Beltrami Island State Forest covers 66,903 acres in Roseau, Lake of the Woods, and Beltrami Counties. The area provides canoeing, camping, fishing, hunting, hiking, horseback riding trails, picnicking, cross-country skiing trails and 120 miles of snowmobile trails. Recreation facilities are spread over a wide area and are accessed from Highway 11 or by local roads. State road maps show few improved access points.
- Hayes Lake State Park is located 18 miles southeast of Roseau and is accessed via Roseau County Road 4. Consisting of 3,000 acres of pines, lakes, and wildlife activity, the park is open year-round for visitor use. Activities include: camping,

swimming, picnicking, hiking, biking, horseback riding, canoeing, and fishing. In the winter, the park features snowmobiling and cross-country skiing with 12 miles of groomed trails (6 for XC-skiing and 6 for snowmobiling). The park trails connect to hundreds of miles of snowmobile trails in the adjacent Beltrami Island State Forest.

- Lost River State Forest, seven miles to the northeast is 63,00 acres of unimproved wilderness forest.
- The Roseau Lake Wildlife Management Area is located 8 miles north of the city.
- The Roseau River Wildlife Management Area, 60,000 acres of natural bog and forest located 12 miles northwest of the city. The area provides excellent wildlife viewing opportunities.

There are no state or national hiking trails within the region although state operated recreation areas provide local trails. There is a loose network of state funded snowmobile trails through the region. There are no all-terrain vehicle (ATV) trails. About a dozen locations within the study area are listed in the *Pine to Prairie Birding Trail* directory, including the City of Roseau and Lost River State Forest.

C. Natural Resources

1. Air Quality - Roseau County is considered an attainment area for all criteria pollutants.

2. Terrestrial Resources

a. Climate/Geology/Soils - Roseau County has a sub-humid to humid continental climate with moderately warm summers, cold winters, and rapid changes in daily weather patterns. On average, the mean monthly temperatures range from 5 degrees to 68 degrees Fahrenheit. About three-quarters of the area's approximately 20 inches of annual precipitation falls during April to September, with two-thirds occurring during May, June and July. The driest months are November through February. Average snowfall is approximately 40 inches per year.

The proposed project area lies within the large, flat geographical area formed by Glacial Lake Agassiz. This lake covered northwestern Minnesota, eastern North Dakota, and a large area of southern Manitoba. Since the recession of Lake Agassiz, streams such as the Roseau River have established meandering courses over the relatively flat till and lake plain. The soils found in the general project area consist mainly of clayey glacial drift, alluvium, and lacustrine soils along with organic soils that derived in marsh/bog areas.

b. Vegetation - Prior to settlement, vegetation in the Roseau Watershed was dominated by wetland (52%) and forested (31%) habitats. Human land use activities have since altered the landscape through gradual conversion of forest (6%) and wetland (43%) to cultivated land (40%). The project area, which includes an area one mile on either side of the structural features, consists of developed urban area and active farmland. There are 721 acres of forested land within the project area. The rich soils and extremely flat terrain of ancient Glacial Lake Agassiz currently support a largely rural, agricultural community. This land use and other human activities have induced significant environmental changes within the watershed, brought

about by numerous drainage ditches, stream channelization projects and to a lesser degree, subsurface tile drainage.

Large wetland complexes are confined to the far northern and southern boundaries of the Watershed. Smaller wetlands are scattered throughout the interior of the watershed but have been heavily impacted by human activities. Many agricultural fields harbor important short-term open water habitat for migratory birds in the spring. Although the extent of these ephemeral, open water areas has not been mapped, aerial photography suggests they are prevalent, but scattered, within the basin. These areas can provide critical feeding and resting areas to birds migrating through the basin, especially if precipitation or snowmelt has inundated other shallow water habitats in their migratory path. The National Wetland Inventory lists the wetlands located in the project area (Table 1a and Plate 7).

Table 1a. Wetlands in the Project Area

Location	Type	Code	Size(Ac)
Near RR tracks	Palustrine, Emergent, Temporarily Flooded	PEMA	1.61
Under East Levee of West Storage Area	Palustrine, Emergent, Temporarily Flooded	PEMA	0.10
West of Sewage Pond	Palustrine, Emergent, Temporarily Flooded, Partially Drained/Ditched	PEMAd	1.46
North of Sewage Pond	Palustrine, Emergent, Saturated, Partially Drained/Ditched	PEMBd	5.71
Woods N. of Hwy 11	Palustrine, Forested, Broad-Leafed, Saturated	PFO1B	20.80
West Near Woods	Palustrine, Forested, Broad-Leafed, Saturated	PFO1B	1.94
East Near Woods	Palustrine, Forested, Broad-Leafed, Saturated	PFO1B	1.21

The proposed project area includes several distinct habitat types. On the south, upstream end the project begins in the Roseau River Valley, which is wide and incised. The upstream end of the diversion channel passes through the oak/ash/cottonwood-wooded area of City Park. Once out of the park, the next two-miles of the diversion passes through agricultural croplands interspersed with residential development and wood lots. As the diversion channel extends northward, the surrounding area loses elevation and is a mix of intermittently farmed land and old-field habitat. In the area of the wastewater treatment plant, the diversion channel transects a wooded gully leading down to the Roseau River. The northern end of the proposed project area, where the diversion channel rejoins the Roseau River, lies within the ten-year floodplain of the river.

c. Wildlife - Given the significant alteration of vegetation and habitat types associated with converting forest and wetland to agricultural cultivation, wildlife in the watershed is surprisingly diverse (Fish and Wildlife Coordination Act Report - Table 2). This is largely due to the presence of publicly owned natural resource areas scattered along the fringes of the watershed, including the Roseau Lake and Roseau River Wildlife Management Areas, and in its more undeveloped reaches within Canada. Forested areas more common to the fringe of the watershed, near Canada or south to the Red Lake Wildlife Management Area (WMA) and

Beltrami Island State Forest, provide habitat best suited to Canada lynx and the gray wolf. Wildlife in the project area is typical of an agricultural landscape. Common wildlife species include white-tailed deer, mink, muskrat, red fox, coyote, striped skunk, meadow vole, meadow jumping mouse and masked shrew. Numerous game and non-game birds frequent the Roseau River watershed (Fish and Wildlife Coordination Act Report - Table 3). Temporary shallow open water located in wet farm fields and seasonal wetlands available during spring provide important habitat benefits to migratory shorebirds and waterfowl. More permanent ponds, lakes and riparian habitat provide additional life history needs such as nesting and foraging potential. Migrating waterfowl such as mallard, blue-winged teal, gulls and a variety of shorebirds traverse the area. Other common birds include the yellow warbler, veery, Baltimore oriole, warbling vireo, red-winged blackbird, bobolink, and swallows. Several of the bird species found within the watershed have experienced population decline and are of special interest to state and/or federal resource management agencies.

3. Aquatic Resources - The Roseau River, the principle aquatic resource in the area, supports both game and non-game fish (Fish and Wildlife Coordination Act Report - Table 1) but diversity, abundance, and geographic occurrence are largely dependent upon existing barriers, water quality issues and winterkill due to low flow events. A low concrete dam located within the city limits of Roseau may present a barrier to fish passage but periodic high flows may facilitate fish passage in early spring. Historically, the most favorable fish habitat close to the city of Roseau could be found in the three miles just upstream of the dam. There are additional low dams on the Roseau River; up and downstream of the proposed project area. The Roseau River within the project area contains approximately 136 acres of riparian habitat.

The Roseau River drainage also supports ten mussel species, including two state listed species of concern. The threeridge (*Amblema plicata*), Wabash pigtoe (*Fusconaia flava*), cylindrical papershell (*Anodontoides ferussacianus*), giant floater (*Pyganodon grandis*), creeper (*Strophitus undulates*), plain pocketbook (*Lampsilis cardium*), fatmucket (*Lampsilis siliquoidea*), and pink heelsplitter (*Potamilus alatus*) have been collected live within the watershed since 1980. Evidence of the white heelsplitter (*Lasmigona complanata*) has been found in the Roseau River, but no live specimens have been collected or reported since 1980.

3. Threatened and Endangered Species - Three species listed as threatened under the Federal Endangered Species Act of 1973 (ESA), as amended, occur within Roseau County and Roseau River Watershed. All three species are classified as "threatened" under the Act, referring to an animal or plant likely to become endangered within the foreseeable future throughout all or a significant portion of its range

The bald eagle (*Haliaeetus leucocephalus*) has been documented in Minnesota and is known to occur in mature forests near water. Bald eagles typically prefer mature trees in forests or corridors that buffer nesting activities but have also been documented in residential areas and near busy transportation corridors. Suitable nesting habitat is available to bald eagles within the Study area and it is possible that eagle pairs may establish additional nests on an annual basis. This is especially true given the population gains of bald eagles that have occurred in Minnesota since their listing almost 30 years ago.

The Canada lynx (*Lynx canadensis*) occurs in northern Minnesota, preferring early successional conifer forests that provide ground cover suitable to support populations of snowshoe hare, as well as older forests that provide cover for denning activities. Although the Canada lynx has been documented in increasing numbers over a wider range than previously recorded, there has been only one confirmed sighting at the southcentral border of Roseau County. The Roseau River WMA has been known to support Canada lynx in the past; therefore, it is feasible that habitat within the Watershed currently supports or provides habitat which could support Canada lynx.

The gray wolf (*Canis lupus*) is a resident of northern Minnesota where it prefers forested areas inhabited by its primary prey, the white-tailed deer. The gray wolf is currently proposed for delisting in Minnesota and other states inhabited by the Eastern Distinct Population Segment.

The state of Minnesota's Endangered Species Statute is similar to federal protective legislation in that it utilizes the same threatened and endangered definitions for protected species. Species of Concern is a designation given to a species that should be monitored carefully because it is extremely uncommon in Minnesota or has unique or highly specific habitat requirements.

State designated species occurring within the Roseau River and Roseau Lake WMAs, located downstream of the proposed project area, are also noted in Fish and Wildlife Coordination Act Report - Table 4. There are seven state designated threatened species occurring in the Roseau River watershed, two of which (horned grebe and Wilson's phalarope) occur within the Roseau River WMA. One of the two state-designated endangered species (Baird's sparrow) is also known to occur within the Roseau River WMA. The yellow rail, listed as a "species of concern" by the Minnesota DNR, is also listed as a "conservation priority species" by the U.S. Fish and Wildlife Service.

4. HTRW - A Phase I survey for hazardous, toxic, and radiological waste (HTRW) was conducted for the proposed project area. This assessment revealed no evidence of Recognized Environmental Conditions (RECs), as defined in ASTM E 1527, within 250 feet of the proposed project area.

D. Cultural Resources - This portion of Minnesota contains numerous cultural resources indicating continual human occupation for approximately 12,000 years. Cultural resource sites within the region exist on a variety of landforms, including uplands, terraces, and glacial beach ridges. Pre-contact cultural resources include lithic and artifact scatters, burial mounds, and cemeteries. Historic cultural resources include Euro-American structural ruins, standing structures and roads. The general project area has been surveyed during several previous flood control studies of the Roseau River. Although no sites were identified in the area proposed for this project, both pre- and post-contact sites were located in adjacent areas.

VI. PROJECT IMPACTS

An environmental analysis was conducted for the proposed project and a discussion of those impacts is presented below. As specified in Section 122 of the 1970 Rivers and Harbors Act, the categories of impacts listed in Table 3 were evaluated. In accordance with Corps of Engineers

regulations (33 CFR 323.4(a)(2)), a Section 404(b)(1) evaluation has been prepared. For purposes of this evaluation the No-Action alternative serves as the base condition against which the Locally Preferred Plan alternative will be compared for the purpose of evaluating impacts. The No-Action plan assumes no Federal action but does assume full implementation of local protection systems so that some level of flood protection will continue for the community. The following project related impacts were identified.

A. Sociological Resources

1. Noise - Noise is defined as "unwanted sound" and, in the context of protecting public health and welfare, implies potential effects on people and, in general, the environment. Noise is one of the major concerns associated with construction-related activities. Existing noise levels in the vicinity of the proposed project site are relatively low, originating from residential construction in the adjoining areas and vehicular traffic along the residential streets. There will be minimal additional noise associated with the construction of the recreational features; the noise will be concentrated in the same areas which are under construction for the flood damage portion of the project. The inclusion of recreational features is not expected to lengthen construction time.

Residents near the proposed site would experience an increase in noise levels during the proposed construction activities. The construction noise would be greater than the noise from traffic at these sites. The work in any one area would be done relatively quickly; thus, the disruption would be temporary. Although there would be more construction required for the LPP and slightly more noise, the additional work would take place in a lightly populated area where noise would be less obtrusive. .

2. Environmental Justice - Executive Order 12898, Environmental Justice, provides that each Federal agency identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States. The proposed action is not expected to have disproportionately negative impacts on minority or low-income populations.

3. Transportation - Project construction could have some short-term minor negative impacts on normal community traffic patterns due to the construction activity and truck hauling. These effects would be attenuated through the appropriate placement of construction and safety signage and use of road detours. These effects would be short-lived and terminate when construction is complete. The project is not expected to have any appreciable permanent effects on the transportation network or traffic patterns.

4. Public Health and Safety - The proposed project would have substantial beneficial effects on public health and safety by significantly reducing the risks of loss of life and property damage attributable to the effects of flooding. In addition, flood protection would minimize the exposure of emergency and clean-up personnel to sewage and other contaminants introduced into the environment during a flood event.

5. Community Cohesion - The proposed project, by providing increased protection from future floods, would enhance community stability. With increased security, residents would be less likely to relocate. Similarly, they would be able to devote greater attention to other community issues and needs. In addition, the recreational features included in the proposed plan will help to enhance the health and appeal of the community, making the community a healthier, more active place to live and visit

6. Community Growth and Development - The proposed project may have a beneficial effect on the growth and development of Roseau. Provision of this level of flood protection may foster added investment in existing homes, businesses, and community infrastructure. The recreation features will help to draw additional people into the Roseau community, and will make Roseau more attractive to people of all ages.

7. Business and Home Relocation - The proposed project would have no appreciable effect on business and home relocation. There are no residential or business relocations in the proposed project right-of-way. Two machine sheds are located in the eastern portion of the proposed project lands. The structures would be purchased, and the landowner would be paid for the relocation of his personal property in and around the structures. One driveway would be lowered six inches for flood control; no adverse effect would be expected.

8. Existing and Potential Land Use - The 2002 flood altered land use as damaged properties were purchased by the city. Further changes would occur along and near the proposed diversion alignments with the purchase of project right-of-way and construction of project features. There would be an addition of recreation features attributable to the proposed project. Other areas within the project would be allowed to revert to natural habitat after planting with native species. Farming may continue within storage levees but might require different techniques due to a change in soil moisture within the levees.

9. Aesthetics – Both the NED plan and LPP would result in changes to the landscape in, and north of, the city of Roseau. Constructed features would be vegetated with native species but would still be visible as man-made structures. Since the structures provide protection from flooding they may be viewed in a positive way. In addition to the features of the NED plan, the LPP would include low berm levees in the rural area that would be seeded with native grasses and would not appreciably intrude on the landscape.

10. Controversy - Most of the controversial aspects of the proposed project are related to the selection of the proposed plan or the location of the diversion alignments. The majority of the project would be constructed outside of the city limits in areas not as prone to flooding as the city. Thus, some of the affected landowners will only receive minimal benefits from the proposed project. Although frequent communications have indicated that no homes would be affected, many landowners have concern about the uncertainty regarding their property and their lives and are waiting for the final feasibility report and public meetings to provide clarification. Owners of agricultural lands that are purchased for the proposed project would be compensated at fair market value.

The diversion channel feature of the proposed project would pass through the Roseau City Park

and Campground area. Loss of parkland, primarily recreational vehicle parking, to excavation would be offset by the development of additional parking area and added recreation features.

Landowners outside the proposed project area have expressed concern about induced flooding damages to their property but the project has been designed to eliminate increased stages outside the project limits when compared to the pre-project existing condition.

11. Unavoidable Effects

The only unavoidable effect would be alteration of the landscape from construction of the restriction bridge and the diversion channel and storage levees. Adverse effects on habitat would be avoided to the greatest extent possible. Minor intrusion into wetlands would be offset by the benefit to drained wetland areas resulting from blocking of ditches and drains by levee construction. During the preparation of Plans and Specifications the potential for partnering with agencies and organizations for the development of habitat in the storage areas would be explored.

B. Economic Resources

1. Property Values - The proposed project is expected to have a minor beneficial effect on property values through the removal of the risk of flood damage along with the removal of restrictions on improvements that can be made to existing developments in the floodplain. New development or intensification of existing development should be pursued only in a manner that retains awareness and sensitivity to the residual flood threat and potential effects to the environment.

2. Tax Revenues - The proposed project would have a minor beneficial effect on tax revenues. The project would preserve property values in protected developed and developable areas, allow for the redevelopment of marginal properties, and remove restrictions on capacity to attract additional businesses and industry. Other factors would be likely to restrain this growth potential. The LPP might result in a slight reduction in tax revenues from farmland over those of the NED plan.

3. Public Facilities and Services - The proposed project could have a substantial beneficial impact on public facilities and services because under the with-project condition the potential for damage to public facilities would be reduced; the potential for disruption in the delivery of public services would be reduced; and the public works response to future flood threat would not be as great.

4. Regional Growth - The proposed project would preserve the capacity of Roseau to function as a trade, medical, financial, and cultural center of the region.

5. Employment - Project construction could have a temporary beneficial impact on local employment, as some of the construction labor is likely to be hired from the community. This effect would cease with completion of the construction.

6. Business Activity - Project construction would stimulate local business activity and

the protection provided by the project upon completion would provide a climate for business expansion and attraction. It is expected that the impact would be minor.

7. Flooding Effects - The project is intended to provide flood damage reduction from floods, such as the one experienced in 2002, by reducing flood stages within the project area when compared to the without project condition.

C. Natural Resources

1. Air Quality - Roseau County is considered an attainment area for all criteria pollutants. Heavy equipment would produce small amounts of hydrocarbons in exhaust emissions. The construction contractor would be required to maintain the vehicles on the sites in good working order to minimize exhaust emissions. Fugitive dust could also result from proposed construction activities so the contractor would be required to conduct dust suppression activities. Adverse impacts to air quality resulting from the proposed activity would be minor and short term in nature regardless of the plan that is implemented.

2. Terrestrial Habitat – The surface areas needed for the proposed project features are as follows: diversion channel – 112 acres; excavated soil disposal – 120 acres; floodway – 232 acres; east storage area – 853 acres; west storage area – 236 acres; and northern area – 299 acres. Of these areas, disturbance caused by project related construction would be restricted to the diversion channel, soil disposal area, the perimeter of the storage areas where levees would be built, and the outlet channel on the northern end of the project. Levee construction would require 37 acres and road raises for levees would require 11 acres. The minor loss of area and amenities in the City Park would be offset by the acquisition and development of project lands. There would be several areas where forested areas would be cleared: 6.0 acres within the City Park area, 4.5 acres in the woodlot north of Hwy 11, and 1.25 acres in the gully west of the wastewater treatment plant. The loss of these wooded areas would be permanent but would be offset, at 2:1 or greater, by tree plantings that would be done along the recreational corridor and in the storage areas. Since there are 721 acres of woods in the project area, the removal and replacement of the trees would not have an appreciable effect. The other areas to be disturbed are currently farmed and have reduced natural resource value. Portions of the storage areas would be available for farming after completion. All other disturbed areas would be replanted with native species, primarily grasses that would have positive impacts on the area's overall habitat value. Overall, the construction activities would have temporary adverse impact on the terrestrial habitat but the eventual changes in vegetative cover would have long term beneficial impacts on the avian and small mammal groups which are found in areas on the periphery of residential development and agricultural plots.

Compared to the LPP, the NED plan would have slightly lower terrestrial habitat impacts during and immediately following construction due to the additional levees and features that would be constructed for the LPP.

3. Wetland – The project alignment would intersect several wetlands, partially or completely (Table 1b). The alignment of the diversion channel has been revised to minimize the quantity of affected wetlands. The changes in alignment will require that several farm storage buildings,

which were previously moved onto the site, would need to be relocated outside the diversion channel alignment.

Examination of aerial photography shows that the area had considerably more wetlands prior to conversion to agriculture. The construction of the levees would cut off existing tile drains and surface ditches, which would allow the storage areas to retain more water and contribute to the redevelopment of prior wetland conditions. Shallow depressions would be excavated in the northern portion of the project to replace those wetlands covered by levee construction. Vegetative species would be planted that are appropriate to temporarily flooded wetlands. Forested wetlands would be replaced by tree plantings of appropriate species within the northern portion of the project. Although the LPP would impact an additional 1.46 acres of wetland, the additional impact would be more than offset by the additional redevelopment of wetlands due to the storage levees cutting off existing tile drains and ditches. The opportunity for inter-agency partnerships to develop the northern area or storage areas for improved habitat would be explored with the non-federal sponsor, interested Federal, state and local agencies and interest groups during preparation of Plans and Specifications.

Table 1b. Wetlands in the Project Area/Wetlands Affected by Alternatives

Location	Type	Code	Size(Ac)	LPP (Ac)	NED (Ac)
Near RR tracks	Palustrine, Emergent, Temporarily Flooded	PEMA	1.61	0.0	0.0
Under East Levee of West Storage Area	Palustrine, Emergent, Temporarily Flooded	PEMA	0.10	0.10	0.10
West of Sewage Pond	Palustrine, Emergent, Temporarily Flooded, Partially Drained/Ditched	PEMAd	1.46	1.46	0.0
North of Sewage Pond	Palustrine, Emergent, Saturated, Partially Drained/Ditched	PEMBd	5.71	0.0	0.0
Woods N. of Hwy 11	Palustrine, Forested, Broad-Leafed, Saturated	PFO1B	20.80	5.0	5.0
West Near Woods	Palustrine, Forested, Broad-Leafed, Saturated	PFO1B	1.94	1.94	1.94
East Near Woods	Palustrine, Forested, Broad-Leafed, Saturated	PFO1B	1.21	1.21	1.21
Total			32.83	9.71	8.25

The groundwater elevation in the project area is approximately that of the river. Construction of the diversion channel would reduce the groundwater elevation outward about 200 feet at the area of deepest excavation, 16 feet, and quickly diminishes to no effect as the excavation becomes more shallow and goes to zero. Outside of the project footprint, there are no wetlands located within the potential area of influence of the excavation so any project induced change in groundwater elevation would have no effect on any wetland.

Wells are required to be cased to 15 feet below ground surface elevation so no adverse effect on wells would be expected to occur as a result of diversion channel excavation.

4. Aquatic Habitat – There would be some disruption of the benthic area during the removal of the existing substrate and the placement of the rock protection for the construction of the restriction bridge, but this would be a temporary condition and would affect a small area, about 1200 square feet. Since the riparian habitat within the project area is on the order of 136 acres, no adverse effect would be expected. The rocky area would quickly repopulate with benthic organisms and the presence of the rock would increase habitat diversity in this reach of the river. The structure would not act as a barrier to fish migration, even during high flows. The head differential would be slight at the structure and the velocity during high water periods would be lower than existing conditions as a portion of the flow would pass down the diversion channel and not through the restriction structure.

During diversion channel operation water velocities would not be excessively high, either in the river or the diversion channel. Although fish tend to maintain position or move upstream, it is possible during high flows that some fish may go downstream in the diversion, likely in proportion to the flow split. Because of the flat topography, water in the diversion may flow in a thin sheet and may not reach the downstream end of the diversion to reenter the river. Fish may follow the diminishing water level upstream and, as long as water was flowing over it, could cross over the diversion sill to return to the river. Fish that did not exhibit this behavior or that did not reach the diversion sill before the river flow dropped below it could be stranded. It would be expected that the number of fish affected would be few and that the effect on the fishery would be minor.

During large floods some fish are likely carried over the bank during flood flows upstream of the project area and may be stranded as flows diminish with the end of the high water period. After project construction this condition would be alleviated by lessening of overbank flows but would likely be replaced by similar conditions in the diversion channel if fish do not follow diminishing flow back to the river.

Only in very large events would water, and any entrained fish, enter the storage areas. As the flood flows diminish, water would be released from the storage areas. Most fish would follow the water back to the river as the flood recedes. Conditions at the lower end of the diversion would be similar to the existing condition and would not increase the likelihood of fish stranding over what may occur at present. The possibility of fish stranding, albeit low with the LPP, is slightly lower with the NED when compared to the LPP, due to the storage areas.

During coordination, the Fish and Wildlife Service identified fish stranding as a potential issue (Enclosure B). Therefore, it was suggested by the FWS that the situation be investigated. It is recommended a survey of the diversion channel be conducted after it has conveyed flood waters to determine if fish have been stranded. The US Fish and Wildlife Service and the Minnesota Department of Natural Resources and other interested parties would be consulted further regarding this issue during the preparation of Plans and Specifications.

The proposed action would maintain the channel forming process in the river by passing, at a minimum, the two-year frequency flow before any flow would pass down the diversion channel. The Minnesota Department of Natural Resources expressed concern regarding the potential for changes in erosion and sedimentation patterns resulting from project operation. During the preparation of Plans and Specifications the US Fish and Wildlife Service and the Minnesota Department of Natural Resources would be consulted regarding the development of a plan to examine the project area for erosion and sedimentation changes after project operation.

5. Habitat Diversity and Interspersion – The proposed action would have overall beneficial impacts on the area's habitat diversity. The rock protection in the river channel would provide diversity of benthic habitat by replacing some of the sandy-clay substrate typical in this portion of the Roseau River. Implementation of the proposed features would also increase diversity in the terrestrial portions of the project area. Land acquisition for the project would return substantial areas to a more natural condition. The diversion channel and portions of the floodway, which had been used for agricultural purposes, would be seeded with native grasses, although it would be mowed to maintain functionality. Within the storage areas severing existing drains and ditches would allow wetland habitat to redevelop. The open area on the northern-most area of the diversion channel would also be planted with native species or allowed to return to a natural, non-agricultural setting. Portions of the storage areas and other areas not used for recreational purposes, agriculture or floodway would be planted with native tree species. The US Fish and Wildlife Service, the Minnesota Department of Natural Resources and others would be consulted during the preparation of Plans and Specifications to develop partnerships for habitat improvement activities in the project areas. All of these actions would increase habitat diversity on lands that recently have been used primarily for cropland or hay fields.

6. Surface Water Quality – The proposed actions would likely have temporary minor adverse impacts on surface water quality. The removal of the river substrate and the placement of rock would result in moderate increases in suspended solids in the river water during the construction period. Once the construction has been completed, water quality would return to pre-project conditions. Erosion from stormwater runoff from the terrestrial construction areas also could have the potential to negatively impact surface water quality during construction and until the area has developed a protective ground cover. In order to minimize any erosion and sedimentation that could occur, a Storm Water Pollution Prevention Plan (SWPPP) would be prepared for the site, and the measures indicated in the plan would be implemented for the proposed action. The SWPPP would contain specific construction measures (e.g., silt curtains, silt fences, drainage swales, hay bales, etc.) to reduce or eliminate runoff impacts during proposed construction activities and reduce the potential for soil erosion after construction. Best management practices as provided in the Minnesota Pollution Control Agency Protecting Water Quality in Urban Areas: A Manual would be used. The construction contractor would also be required to implement protective measures to prevent spillage of chemicals, fuels, oils, greases, bituminous materials, waste washings, herbicides, insecticides, or any other materials associated with construction activities, and keep these materials from entering drainages. With implementation of measures identified in the SWPPP and the incorporation of best management practices (BMP) to reduce spillage, the proposed project would be anticipated to have only temporary, minor adverse impacts on surface waters.

Compared to the LPP, the NED plan would have slightly lower temporary, minor surface water impacts during construction due to the additional levees and features that would be constructed for the LPP.

7. Groundwater – The groundwater elevation in the project area is approximately that of the river. The depth of groundwater varies throughout the project area. It is anticipated that the proposed diversion ditch would cause a minor depression in the groundwater level along its length. This zone of influence would be up to 200-feet at the deepest portion of the channel (16-feet) receding as the depth of the cut is reduced to zero by the changing ground surface elevation. Wells are required to have 15 feet of casing below the surface so the project should have no adverse effect on wells in the area.

8. Threatened and Endangered Species - Three Federally listed threatened and endangered species are listed for Roseau County: the gray wolf (*Canis lupus*) – threatened; the Canada lynx (*Lynx canadensis*) – threatened; and the bald eagle (*Haliaeetus leucocephalus*) – threatened. After evaluating the type and quality of habitat in the project area and records of these species in the area, a determination was made that the project would have no physical effect on these species nor would it alter any of their life requisites, such as food supply or habitation. A similar evaluation of State listed species in the project also led to the determination that these species would also not be affected.

9. Hazardous Materials and Wastes - Corps of Engineers personnel examined the proposed sites for the presence of hazardous materials and waste. No evidence was observed that would indicate surface or subsurface contamination. Past usage has been limited to production of agricultural products. Hazardous materials such as oil, fuel or paint may be used on the sites during construction activities. Any hazardous materials and waste on the site associated with construction activities would be stored in appropriate containers or facilities. Fueling of construction equipment would normally occur off site, and all hazardous materials would be handled and disposed of in accordance with applicable local, State, and Federal regulations. Proper implementation of these regulations would prevent the occurrence of significant adverse impacts resulting from hazardous materials and wastes.

D. Cultural Resources

A Phase I survey would be conducted for the proposed projects area prior to any construction. This would include a surface reconnaissance along the proposed levee and channel alignments and associated work and staging areas, deep site testing over archaeologically sensitive areas (i.e., floodplain) and shovel testing in other sensitive areas (i.e., terraces, topographic high spots) that would be directly or indirectly affected by earth-moving activities (e.g., levee and channel construction). Any cultural resources sites identified in the project construction limits would be evaluated for eligibility to the NRHP. Potential project impacts to eligible properties would be mitigated prior to construction, if said impacts cannot be avoided. A Programmatic Agreement has been developed outlining the St. Paul District Corps' Section 106 responsibilities and approach for this project; the agreement was presented to the Minnesota State Historic Preservation Office (SHPO). However, the SHPO declined to sign the document, noting that

such an agreement is not necessary as following the Section 106 process will accomplish the SHPO review and fulfill the Corps' responsibilities.

E. Recreation

Recreational features are being included in the recommended plan; these features contain multipurpose trails, off-road vehicle trails, a canoe trail, a fishing pier, parking facilities, a trailhead, and tree plantings. The recreation plan could result in a healthier, more vibrant community accenting the current growth trends of the region. The plantings associated with the recreation will make the recreational opportunities more visually pleasing and will help to enhance the overall experience. The local community is enthusiastic about the recreational opportunities being presented in the recommended plan.

F. Cumulative Effects

Since adverse effects, other than those that are temporary and construction related, have been avoided or minimized, and some terrestrial and wetland habitat development is likely, it is not expected that this project would contribute to adverse cumulative effects. There is an on-going study of an overall plan to reduce flooding in the Roseau River Basin, but no alternatives have been recommended. In addition, plans are nearing completion for an overland flow interceptor channel to the west of the city of Roseau. It is anticipated that construction of this structure would be done prior to, or concurrently with, implementation of the East Diversion channel

The project would ultimately facilitate the installation of utility and roadway infrastructure supporting future residential development of the site. This is not inconsistent with the City's desire to provide residential development, especially outside flood hazard areas. The water and sewer service may allow for future development of adjoining areas. However, these areas are largely outside the City limits. Expansion to these areas would, by its nature, need to be consistent with the City's growth management objectives and Federal, state and local environmental regulations. Potential adverse effects of city growth on natural and social resources would be likely to occur with or without the project as the city has grown, even while depending on emergency flood protection measures.

VII. ALTERNATIVES

Other alternatives considered were:

A. No Action

The city would continue to rely on a local emergency levees system and flood fighting for flood protection. Some multipurpose upstream reservoir/storage projects may be constructed but would only reduce major flood stage by less than a foot, which would leave Roseau highly susceptible to future flooding. This alternative was not selected, as it did not solve the problems associated with the existing conditions.

B. Upstream Water Storage Impoundments - Multi-purpose impoundments upstream of Roseau could be developed to provide storage that would reduce the 100-year flood stage at Roseau.

Recent studies of this alternative found that a lower level of protection was provided at a cost similar to or substantially higher than the selected alternative. Impoundments may permanently alter high quality riverine habitat whereas the selected plan would have minimal effect on riverine habitat.

C. Permanent Levee/ Floodwall System - Certifiable permanent flood levees and floodwalls would be constructed on both the west and east sides to provide 100-year level of protection. In order to minimize upstream impacts, modification of the railroad bridge would be necessary as a secondary and mitigating feature to be combined with the levee plans. Although a levee/floodwall system providing the desired protection is economically feasible, the selected alternative provides these same benefits at a lower cost. In addition construction of this alternative would result in substantial social and environmental disruption from home relocations and alteration of existing habitat. The selected plan would require no home relocations nor disturbance of riparian habitat that would be required if levee/floodwalls were constructed. For these reasons the alternative was not selected.

D. West Aligned Diversion Channel - A West Diversion channel would be constructed west of the Roseau River and would split floodwater flows between the river channel and an excavated diversion channel. This channel would not begin to carry flows until a 2-year or larger flood event. It would involve channel excavation of a 300-foot bottom width, construction of a number of bridges, tieback levees, a channel restriction structure, and an inlet control structure. This alternative would have appreciably greater environmental impacts because of its greater length and potential adverse effects on wetlands that would not occur with the selected plan. This diversion plan would not be as cost effective as the selected plan so it had less net benefits than East Diversion plans. Based on these comparisons this alternative was not selected.

E. North Aligned Diversion Channel - This diversion channel would be built north and west of the Roseau River and would split floodwater flows between the river channel and a diversion channel. This plan would be similar to the selected plan and the west diversion plan in that it would begin to carry flows after a 2-year or larger flood event. It would involve channel excavation, and construction of tie back levees, 2 bridges, a main channel restriction structure, and an inlet control structure. This plan would have environmental effects comparable to those of the recommended plan. This diversion plan was not as cost effective and has approximately $500,000 less net benefits than the larger East Diversion plans. In addition, the plan did not remove a majority of the city from the 100-year flood plain. Therefore, it did not meet the objective of the project and was not considered a practicable alternative. Based on these comparisons, this alternative was dropped from further evaluations.

F. Non-Structural Measures – This alternative would include features such as floodproofing, elevating or relocating structures. Because of the very flat topography in the proposed project area, a high number of structures would need to be altered or removed. Although this alternative would have less adverse effects on natural resources than the selected plan, it is cost prohibitive due to the large number of structures in the floodplain. In addition there would be substantial social disruption with the implementation of this alternative. For these reasons, this alternative was dropped from further consideration as a stand-alone feature. Non-structural measures were

considered as an addition to the recommended plan and were determined to be inefficient. The change in alignment may require a few relocations of farm outbuildings.

G. Alternative bottom-widths for the East Diversion Channel: The same alignment would be used as for the selected East Diversion Channel alternative, but a bottom width of 50 feet or 350 feet would be used. The 50-foot alternative would provide only a 25-year-flood level of protection, leaving the city at greater risk with large residual damages, therefore not meeting the project objectives. The 350-foot alternative would have incrementally higher social and environmental impacts over the selected 150-foot alternative.

VIII. COORDINATION

The Corps of Engineers has held two public meetings in the City of Roseau on the proposed action. The first meeting solicited input from the public on their desires and concerns related to the flood control in the project area. The second meeting was used to present an earlier iteration of the selected plan. In both cases public input was incorporated into the selection and design of the proposed plan. Periodic updates of the planning process were made available to the public on the District's webpage. In addition, the Corps has coordinated the proposed project with the Minnesota Department of Natural Resources (MDNR), the U. S. Fish Wildlife Service (USFWS), and the Minnesota State Historic Preservation Office (SHPO).

A Programmatic Agreement (PA) was developed which outlined the St. Paul District Corps' Section 106 responsibilities and approach for this project. The PA was presented to the Minnesota State Historic Preservation Office (SHPO). However, the SHPO declined to sign the document, noting that such an agreement is not necessary as following the Section 106 process will accomplish the SHPO review and fulfill the Corps' responsibilities. Also, the Advisory Council on Historic Preservation indicated that they do not need to participate in consultation for the project.

Comments provided by the USFWS in the Planning Aid Letter have been addressed, as noted in the USFWS Coordination Act Report (Enclosure B-FWCAR). Recommendations provided in the FWCAR addressed potential adverse effects on wetland habitat and proposed a monitoring plan for fisheries. These recommendations are answered in a response to comments (Enclosure B), addressed in the EA and summarized here.

The potential need to conduct a Habitat Evaluation Procedure (HEP) analysis for the proposed project was discussed with the USFWS during the scoping process. Due to limited scope and extent of the proposed features at that time, it was felt that conducting a detailed HEP analysis would not be warranted and was not included in the SOW for Coordination Act funding – USFWS concurred with this approach. Conditions did not appreciably change over the course of the study to alter this decision.

As discussed in this document, adverse effects on wetland habitat would be avoided or minimized. Some in-kind wetland development would be initiated through excavation of shallow depressions within the storage areas. Tree planting in wet areas of the storage cells would provide forested wetland habitat. It would be expected that there would be some reversion of

portions of storage areas and the diversion channel to wetland habitat after construction that would result from cutting off tile and surface drainage within the storage areas. Partnering with interested agencies and organizations would be sought to develop habitat and the resulting habitat would likely offset any remaining effects on wetland or terrestrial habitat.

Based on agency comments, a monitoring plan would be formulated and implemented to evaluate the effects of the project on erosion and sedimentation after flood events in which the diversion channel functions. This plan would include interagency coordination and would occur at a frequency agreed to by the interested parties.

The US Fish and Wildlife Service (USFWS) discussed concerns about fish stranding and recommended that a fish monitoring plan be developed to monitor it. The conclusion in this EA and of the Minnesota Department of Natural Resources (MDNR) was that fish stranding would be minimal for reasons discussed in the aquatic habitat section. To address the concerns of the USFWS, it is recommended that surveys of the diversion channel be done after it operates. The planning for these surveys would be coordinated with the USFWS and MDNR and other interested parties.

This assessment will be sent to the USFWS, the U.S. Environmental Protection Agency, the MDNR and the Minnesota Pollution Control Agency. This document will also be made available to other Federal and State agencies and the interested public for review and comment. Water Quality Certification has been requested from the State of Minnesota.

IX. APPLICABLE ENVIRONMENTAL LAWS AND REGULATIONS

Table 2 summarizes the status of project actions proposed by the Corps of Engineers in relation to applicable environmental laws and regulations.

Table 2 - Status of Project Compliance with Applicable Laws and Statutes

STATUTES OR DIRECTIVES	STATUS
Federal Statutes	
Archeological and Historic Preservation Act	Full
Clean Air Act of 1977, as amended	Full
Clean Water Act of 1977, as amended	Full
Coastal Zone Management Act	N/A
Endangered Species Act of 1973, as amended	Full
Farmland Protection Policy Act of 1984	Full
Federal Water Project Recreation Act, as amended	Full
Fish and Wildlife Coordination Act, as amended	Full
Full Estuary Protection Act	N/A
Land and Water Conservation Fund Act, as amended	Full
Marine Protection, Research and Sanctuaries Act, as amended	N/A

National Environmental Policy Act of 1969, as amended	Full
National Historic Preservation Act of 1966, as amended	Full
Resource Conservation and Recovery Act	N/A
Rivers and Harbors Act	Full
Full Watershed Protection and Flood Prevention Act, as amended	Full
Wild and Scenic Rivers Act, as amended	N/A
Executive Orders, Memorandums, etc.	
Floodplain Management (E.O. 11988)	Full
Full Protection of Wetlands (E.O. 11990)	Full
Full Environmental Effects Abroad of Major Federal Actions (E.O. 12114)	N/A
Analysis of Impacts on Prime and Unique Farmlands (CEQ Memorandum, August 11, 1980)	Full
Protection and Enhancement of Environmental Quality (E.O. 11514, as amended by E.O. 11991)	Full
Protection and Enhancement of the Cultural Environment (E.O. 11593)	Full
Environmental Justice (E.O. 12898)	Full

Table 3. ENVIRONMENTAL ASSESSMENT MATRIX

Section 122 of the River and Harbor and Flood Control Act of 1970 (P.L. 91-611)

PARAMETER	MAGNITUDE OF PROBABLE IMPACTS						
	BENEFICIAL EFFECT			NO APPRECIABLE EFFECT	ADVERSE EFFECT		
	SIGNIFICANT	SUBSTANTIAL	MINOR		MINOR	SUBSTANTIAL	SIGNIFICANT
A. SOCIAL EFFECTS							
1. Noise					X (Temp.)		
2. Aesthetic Values				X			
3. Recreational Opportunities			X				
4. Transportation					X (Temp.)		
5. Public Health and Safety		X					
6. Community Cohesion (Sense of Unity)			X				
7. Community Growth and Development			X				
8. Business and Home Relocation				X			
9. Existing and Potential Land Use			X				
10. Controversy				X			
B. ECONOMIC EFFECTS							
1. Property Values			X				
2. Tax Revenues			X				
3. Public Facilities and Services		X					
4. Regional Growth				X			
5. Employment			X (Temp.)				
6. Business Activity			X				
7. Farmland/Food Supply				X			
8. Water Supply				X			
9. Flooding Effects		X					
10. Energy Needs and Resources				X			
C. NATURAL RESOURCES EFFECTS							
1. Air Quality					X (Temp.)		
2. Terrestrial Habitat				X			
3. Wetlands				X			
4. Aquatic Habitat				X			
5. Habitat Diversity and Interspersion			X				
6. Biological Productivity				X			
7. Surface Water Quality					X (Temp.)		
8. Water Supply				X			
9. Groundwater					X		
10. Soils				X			
11. Threatened or Endangered Species				X			
D. CULTURAL RESOURCE EFFECTS							
1. Historic Architectural Values				X			
2. Pre-Historic and Historic				X			

ENCLOSURE A

404(b)(1) EVALUATION

Preliminary

404(b)(1) EVALUATION

ROSEAU, MINNESOTA
FLOOD DAMAGE REDUCTION PROJECT
ROSEAU RIVER

I. PROJECT DESCRIPTION

A. Location

The project features described below are located on the Roseau River in the city of Roseau, Minnesota (Plate 1).

B. General Description

The St. Paul District, Corps of Engineers in partnership with the city of Roseau, Minnesota has developed plans to construct a flood damage reduction project on the Roseau River in and near the city of Roseau. The proposed project would consist of features designed to reduce the potential for flooding within and upstream of the city. The features would include a diversion channel that would divert a portion of the river flow upstream of the city and return it to the river downstream of the city and a restriction bridge that would be placed in the Roseau River immediately downstream of the diversion inlet to raise the water surface elevation and increase the efficiency of the diversion channel. In addition, on the downstream end of the project there would be levees on either side of the diversion channel forming a floodway and storage areas that have been designed to store excess water carried through the diversion channel during peak flows, eliminating induced flooding downstream (Plate 2). Alternatives to the locally preferred plan (LPP) included the NED plan (the LPP less the storage areas), upstream storage, other diversion plans, permanent levees with home relocations, and no action.

C. Authority and Purpose

A 30 September 1974 Resolution of the Senate Committee on Public Works, which requested that the Corps investigate Flood Control within the basin of the Red River of the North, among other areas, provides the authorization for the study of this project.

D. General Description of Dredged or Fill Material

1. *Physical Characteristics* - Rock for the project would be obtained from operating sources or farm field piles. Stone for riprap would be durable material free from cracks, blast fractures, bedding, seams and other defects that would tend to increase deterioration from natural causes. Bedding used for the base layer would be clean rock 8-inches in diameter, or smaller, produced from an operating facility. Levee material would be locally excavated soil from the diversion channel.

Geotextile fabric, placed on streambanks prior to stabilization with riprap, would meet the requirements of MNDOT 3733, Type IV.

2. *Chemical Characteristics* - All stone would be clean and reasonably free from soil, quarry fines, and would contain no refuse. Materials would be obtained from approved pits/quarries in the project vicinity and would be free of chemical contaminants.

3. *Quantity of Material* - Approximately 5,000 square feet of channel excavation and a minor amount of vegetation stripping would be required as part of site preparation. An estimated 5,000 square feet of bedding and 278 cubic yards of riprap would be required to complete construction of the restriction bridge. Geotextile fabric would be placed on streambanks prior to stabilization with riprap. Approximately 178 cubic yards of riprap would be used at the outlet structure. Additional riprap would be used for bank protection at each of the three bridges within the project area.

E. Description of the Proposed Discharge Sites

1. *Location* - The proposed project is located on the Roseau River within and downstream of the city limits of Roseau, Minnesota (Roseau County).

2. *Size* - Approximately 1,200 square feet would be affected by the construction of two concrete abutments that would form the restriction bridge. Riprap would be placed on the channel bottom under the bridge and would convert substrate types from sandy-clay to rock. Riprap would also be used for bank protection, transitions into and out of the diversion channel and armoring of bridge abutments. A total area of less than 0.25 acre would be affected. Conversion of aquatic habitat to terrestrial habitat is not anticipated. Four wetlands totaling 4.7 acres would be partially or completely filled but would be offset by wetlands developed in an area at the downstream end of the diversion channel.

3. *Type of Site/Type of Habitat* – Aquatic habitats located within the project area are typical of the Roseau River. Depths generally vary from 1 to 2 feet near shoreline areas to about 3 feet at mid-channel locations. Substrates present include a mixture of sand and clay. The channel is approximately 30 feet wide in the vicinity of the project. Affected wetlands are Palustrine, Emergent, Temporarily Flooded, Drained/Ditched (1.56 acres, LPP or 0.1 acres, NED) and Palustrine, Forested, Broad-Leafed (8.15 acres LPP or NED).

F. Description of Disposal Method

Cranes, backhoes, dump trucks and other heavy machinery suited to working with rock would be used to deliver and place rock materials during construction. Riprap would generally be placed in a systematic manner to ensure a continuous uniform layer of well-graded stone. Stone placed underwater would not be cast across the surface of the water. Levee material would be placed with earth moving equipment.

II. FACTUAL DETERMINATIONS

A. Physical Substrate Determinations

1. *Substrate Elevation and Slope* – Substrate under the restriction bridge would be excavated before placement of riprap to ensure that the existing substrate elevation was maintained. Riprap placed on slopes for erosion protection would follow the existing contour.

2. *Sediment Type/Substrate Changes* – Substrate in the Roseau River are sandy clay. Placement of riprap for erosion protection would convert existing substrates to rock.

3. *Dredged/Fill Material Movement* - Use of interlocked riprap would ensure little or no post-construction movement of materials.

B. Water Circulation, Fluctuation, and Salinity Determination

1. *General Water Chemistry* - The use of clean fill material would preclude any significant impacts on water chemistry during project construction. Some minor, short-term decreases in water clarity are expected from the proposed fill activities. No significant impacts on water color, odor, taste, dissolved oxygen levels, temperature or nutrient levels are anticipated.

2. *Current Patterns and Circulation* - The restriction bridge would increase the water surface elevation of higher volume discharges to initiate operation of the diversion channel. There would be no change to current patterns and circulation for normal flows.

3. *Sedimentation Patterns* - The project is not expected to affect sedimentation patterns within or below the project area. Stabilization of streambanks is included in the project plan and should result in reduced streambank erosion in the immediate project vicinity. These assumptions would be validated through a monitoring plan created in cooperation with interested parties and agencies.

C. Suspended Particulate/Turbidity Determination

1. *Suspended Particulates and Turbidity* - Turbidity and the concentration of suspended solids would be expected to increase temporarily during construction of project features. However, increases would be relatively minor and restricted to a relatively localized area. No long-term adverse impacts on water quality are expected.

2. *Effects on Chemical and Physical Properties of the Water Column* - Some minor short-term impacts on light penetration and aquatic organisms would occur during riprap placement. However, these effects would be rapidly dissipated upon project completion. No effects are expected on toxic metal concentrations, pathogens, or the aesthetics of the water column.

D. Contaminant Determinations

The use of clean, quarry-run rock riprap for construction would not introduce contaminants into

the aquatic system. Neither the materials used nor the placement method would cause relocation or increases of contaminants in the aquatic system.

E. Aquatic Ecosystem and Organism Determination

The effects of project construction are discussed in detail in the main *Environmental Assessment* section of this report. The more important effects are summarized in the following paragraphs.

1. *Effects on Plankton* - During construction, increases in turbidity and suspended solids near the fill activities might have a short-term localized effect on phytoplankton productivity. The plankton populations should recover quickly once the fill and other construction activities have ceased. In the long-term, overall aquatic habitat quality would improve, with resulting positive effects on plankton.

2. *Effects on Benthos* - Placement of rock during construction would cover and smother benthic communities located within the footprint of these structures, or would require excavation of substrates within the footprint. However, rapid colonization of newly placed rock substrates would be anticipated with minimal long-term effects.

3. *Effects on Fish* - Increases in turbidity and suspended solids during construction would temporarily displace fish occupying project areas. Fish are more mobile than benthic invertebrates and would likely simply avoid construction areas during project construction.

4. *Effects on Aquatic Food Web* - The proposed project is not expected to affect the total productivity of the Roseau River although there would be a temporary disruption to the aquatic biota present during project construction.

5. *Effects on Special Aquatic Sites* – With the LPP, 9.71 acres of wetland will be filled; with the NED plan, 8.25 acres of wetland will be filled. As part of the project design, wetlands would be replaced in-kind, in close proximity.

6. *Threatened and Endangered Species* - No known Federally-listed threatened or endangered species would be affected by the project. The project has been coordinated with the U.S. Fish and Wildlife Service and they concur with this determination.

7. *Other Wildlife* - The fill activities would not result in the significant loss of aquatic or terrestrial habitat. The general diversity and productivity of the affected areas would be maintained.

8. *Actions Taken to Minimize Impacts* – The LPP and NED plan both impact wetlands, with the LPP impacting an additional 1.46 acres of wetland. The alignment of the diversion channel was adjusted to avoid wetlands.

F. Proposed Disposal Site Determination

1. *Mixing Zone Determination* – The proposed fill activities would have minimal mixing

zones. The fill material used for the project would be sufficiently large and relatively clean so that very little exposed material could be suspended in the water column.

2. *Determination of Compliance with Applicable Water Quality Standards* - The fill materials used for this project would be obtained from approved quarries in the project area. The area does not have a history of contamination, which should insure that State water quality standards would not be violated because of project-related activities. Water quality certification from Minnesota and North Dakota would be obtained prior to project construction.

3. *Potential Effects on Human Use Characteristics* - The project would provide community flood protection without adversely affecting the river under normal conditions. The land acquired for the project would provide locations for the installation of recreational features. Water related recreational use of the project area would not be adversely affected by the project.

G. Determination of Cumulative Effects on the Aquatic Ecosystem

Implementation of the proposed action would cause no significant cumulative adverse impacts on the aquatic ecosystem.

H. Determination of Secondary Effects on the Aquatic Ecosystem

No adverse secondary affects on the aquatic ecosystem are anticipated as a result of the fill activities. Disturbed aquatic habitat would be expected to quickly recover.

III. FINDING OF COMPLIANCE WITH RESTRICTIONS ON DISCHARGE

1. The Locally Preferred Plan (LPP) is a least environmentally damaging practicable alternative and satisfies the Section 404(b)(1) guidelines of the Clean Water Act. The NED is also a least environmentally damaging practicable alternative. In comparison to the NED, the LPP impacts an additional 1.46 fewer acres of wetlands, but those impacts would be more than offset by additional redevelopment of wetlands due to the storage levees cutting off existing tile drains and ditches. Additionally, the NED plan presents logistical issues - downstream opposition due to the potential for increased water level during floods coupled with the need to acquire land outside of the condemnation authority of the local sponsor - that are not present under the LPP.

2 In addition to the NED plan and the LPP, the other alternatives considered were: no action, upstream storage, other diversion plans, and permanent levees. More detail on these plans can be found on page 22-23 of the Environmental Assessment and pages 19, 21-24 of the feasibility report.

3. The LPP complies with all State water quality standards. The disposal operation would not violate the Toxic Effluent Standards of Section 307 of the Clean Water Act.

4. Use of the selected disposal site would not harm any endangered species or their

critical habitat.

5. The LPP would not result in significant adverse effects on human health and welfare, including municipal and private water supplies, recreation, and commercial fishing. The LPP would not adversely affect plankton, fish, shellfish, wildlife, and special aquatic sites. The life stages of aquatic life and other wildlife would not be adversely affected. Significant adverse effects on wetlands, aquatic ecosystem diversity, productivity, and stability and on recreational, aesthetic, and economic values would not occur.

6. To minimize the potential for adverse impacts, the fill would be placed during periods of normal to low water levels. Since the LPP would not result in any net adverse effects, additional measures to minimize impacts would not be required.

7. On the basis of this evaluation, I find that the LPP plan complies with the requirements of the guidelines for the discharge of dredged or fill material.

Date _____

Michael F. Pfenning
Colonel, Corps of Engineers
District Engineer

ENCLOSURE B

AGENCY CORRESPONDENCE

Record of Telephone Conversation 2 Nov 2005

Michael Larson	MDNR Area Fisheries Manager	218-634-2522
John Shyne	COE, Environmental Analysis	651-290-5270

Subject: Roseau Flood Control EA, Natural Resources Coordination

1. I called Mr. Larson in regard to the concern of the US Fish and Wildlife Service (FWS) concern to him; some stranding occurs now and could be reduced by the project.

2. Mr. Larson said that the Minnesota Department of Natural Resources (MDNR) was concerned about the potential for erosion and sedimentation changes in the river channel that might result from the operation of the diversion channel. He said that there might be upstream headcutting and downstream sediment transfer and cited some examples that he was familiar with.

3. Mr. Larson recommended that we monitor the situation after construction, annually for five years and possibly less often after initial information is gathered and analyzed.

4. Mr. Larson's concerns have been added to the EA and during the preparation of Plans and Specifications; there will be coordination with the MDNR, FWS and others to develop a monitoring plan.

Record of Telephone Conversation 3 Nov 2005

Laurie Fairchild	USFWS MN Area Office	612-725-3548 x214
John Shyne	COE, Environmental Analysis	651-290-5270

Subject: Roseau Flood Control EA, Natural Resources Coordination

1. I called Ms. Fairchild regarding her comments in the Fish and Wildlife Coordination Act Report.

2. We discussed how the project might affect wetlands. The project map has not been overlaid with the National Wetland Inventory but only a few wetlands may be affected. Ms. Fairchild said that since the levees would cut off existing ditches, that some wetland redevelopment would likely occur in the storage areas.

3. We discussed Ms. Fairchild's request for monitoring of the diversion channel for fish stranding. I pointed out that the MDNR did not consider it an area of concern. She said that she did not agree and that we should examine the diversion channel after it has operated. We agreed to talk further on this issue in the future.

4. I mentioned the MDNR concern about erosion and sedimentation changes and Ms. Fairchild said that she agreed and would coordinate with the COE in the future on that issue.

Record of Telephone Conversation 11 Jan 2006

Laurie Fairchild	USFWS MN Area Office	612-725-3548 x214
John Shyne	COE, Environmental Analysis	651-290-5270

Subject: Roseau Flood Control EA, Fish in the Diversion Channel

1. I spoke to Ms. Fairchild regarding information that I had obtained on velocities and discharges in the river and the diversion during high water.

2. I pointed out that the velocities would be low and that the majority of the flow would remain in the river channel. She said that she felt that juvenile fish would still be at risk and that field checking would be required.

ENCLOSURE C

DRAFT FONSI

DEPARTMENT OF THE ARMY
ST. PAUL DISTRICT, CORPS OF ENGINEERS
190 FIFTH STREET EAST, SUITE 401
ST. PAUL, MN 55101-1638

REPLY TO
ATTENTION OF

Draft
Finding of No Significant Impact

In accordance with the National Environmental Policy Act, the St. Paul District, Corps of Engineers, has assessed the environmental impacts of the following project:

ROSEAU, MINNESOTA
FLOOD DAMAGE REDUCTION PROJECT
ROSEAU RIVER

The purpose of the actions proposed in this environmental assessment is to provide flood protection to the city of Roseau, Minnesota. Activities would include the construction of a diversion channel, a restriction bridge in the Roseau River, and several levees including those which would establish water storage areas for large volume floods. The project is described in Section IV of the Environmental Assessment. This Finding of No Significant Impact is based on the following factors: the project would have substantial positive impacts on public health and safety, flood damage reduction and recreation and would have no appreciable effects to fish, wildlife, woodland, and wetland resources or the social or cultural environment. None of the project effects were determined to be significant. Continued coordination will be maintained with appropriate agencies and individuals.

The environmental review process indicates that the proposed action does not constitute a major Federal action significantly affecting the quality of the human environment. Therefore, an Environmental Impact Statement will not be prepared.

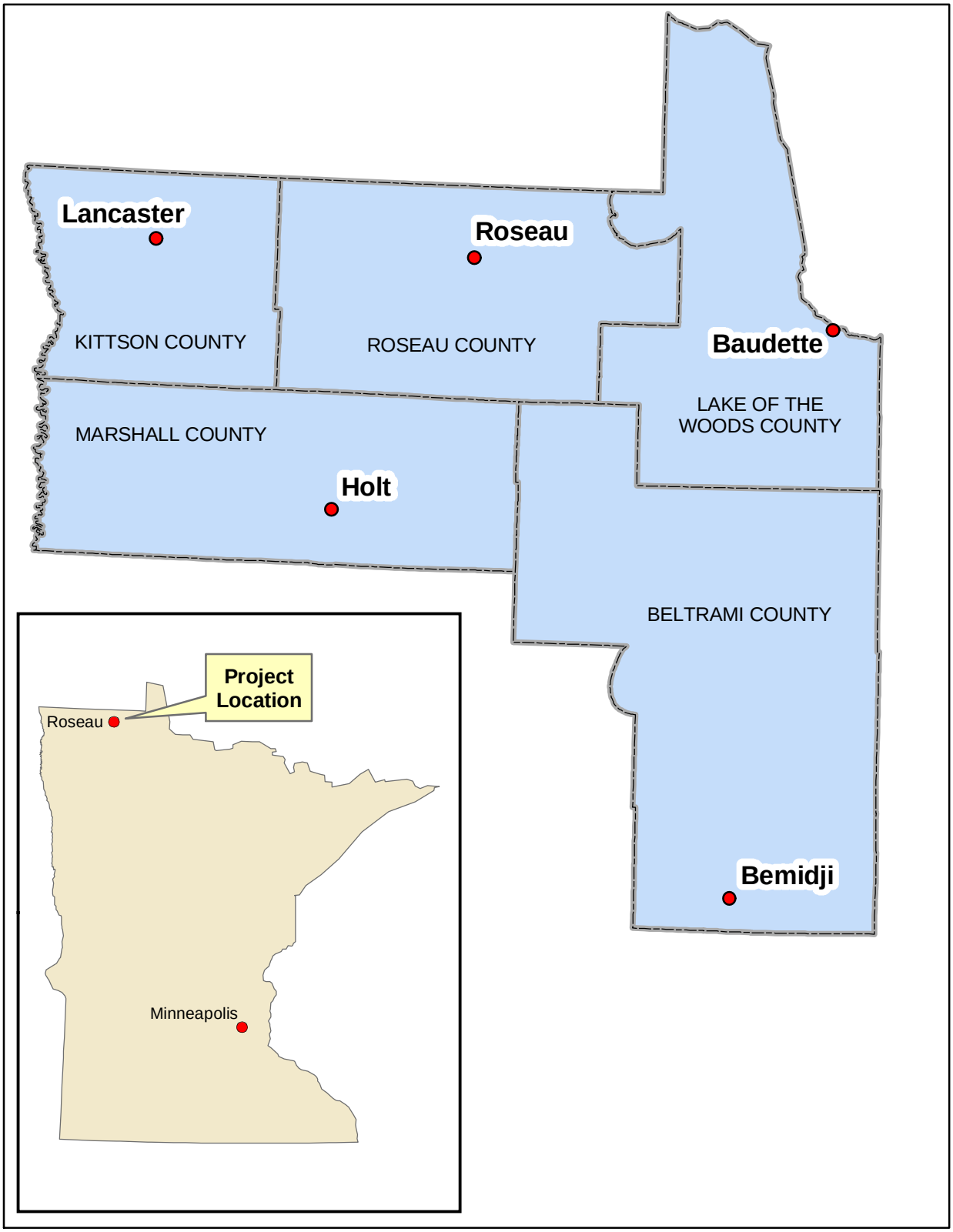
_____ _____

Date

Michael F. Pfenning
Colonel, Corps of Engineers
District Engineer

Environmental Assessment Plates

LIST OF PLATES



St. Paul District
GIS CENTER
US Army Corps
of Engineers®

City of Roseau, Minnesota - Location Map

22 0 22 44
Miles

N

Plate 1

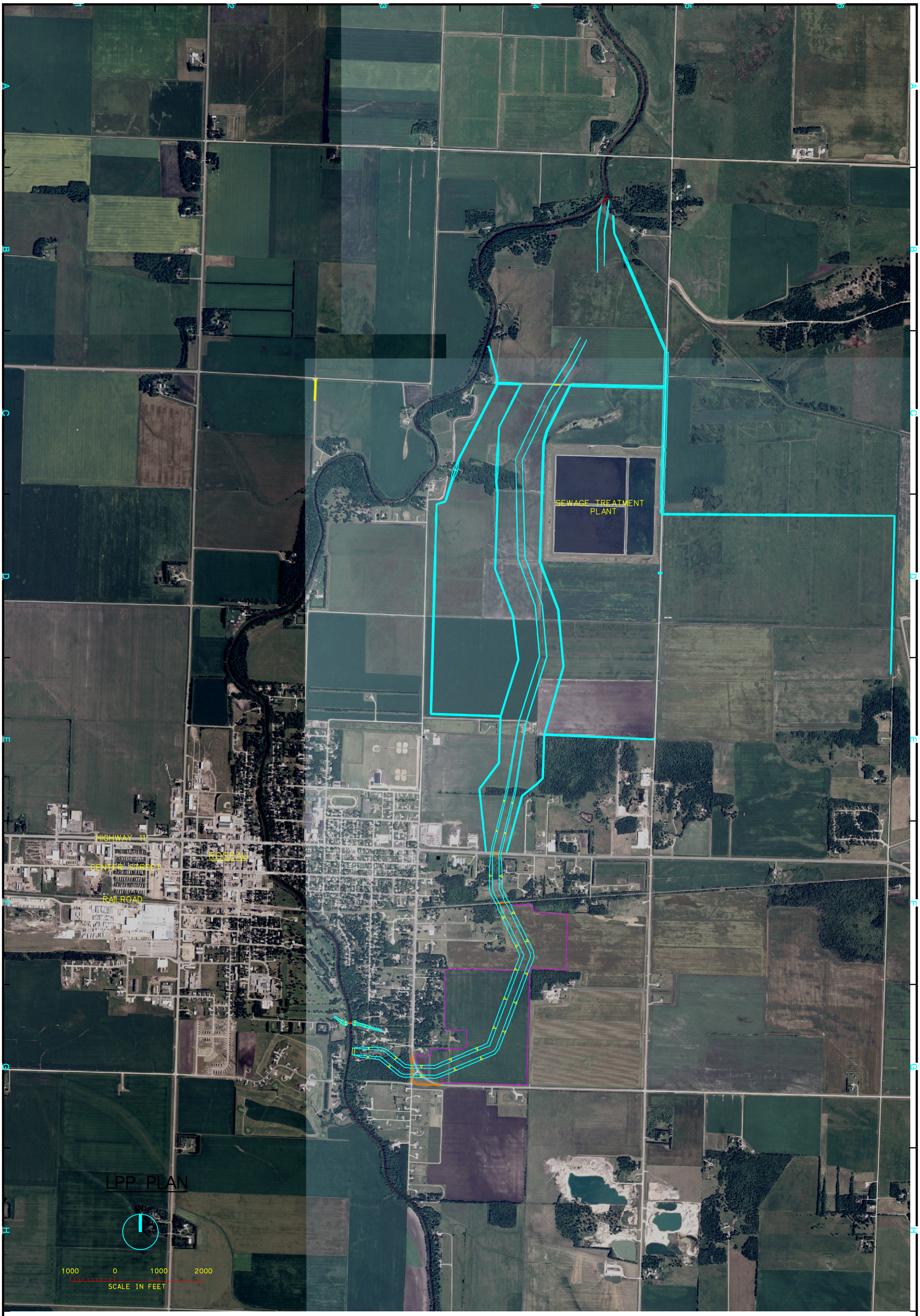


Plate 2

SHT OF

DRAWING NUMBER:

ROSEAU FEASIBILITY STUDY

FLOOD CONTROL

SITE PLAN-LPP
EAST DIVERSION - 150' BOTTOM WIDTH

DEPARTMENT OF THE ARMY
ST. PAUL, MINNESOTA
CORPS OF ENGINEERS
ST. PAUL DISTRICT

ED-D

DESIGNED: JGS/GCW
CHECKED: XXX/XXX
DRAWN: GCW

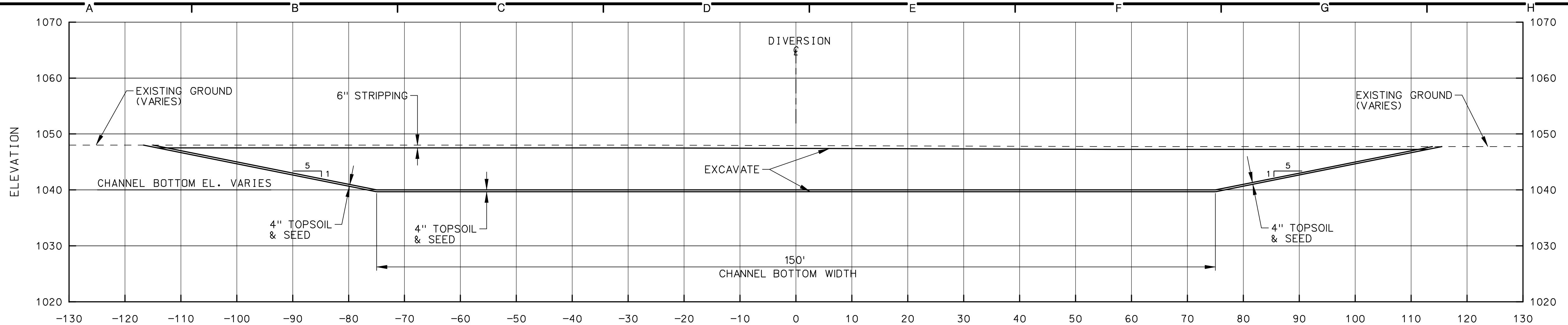
ED-H

DESIGNED: SMG
CHECKED: XXX/XXX

SCALE: AS SHOWN
DATE: APRIL 06
CADD FILE NAME: furc16460_LPP.DGN
SOL. NO: DACW37-01-B-0000
AE APPROVING OFFICIAL:

Symbol	Description	Date	Appr.

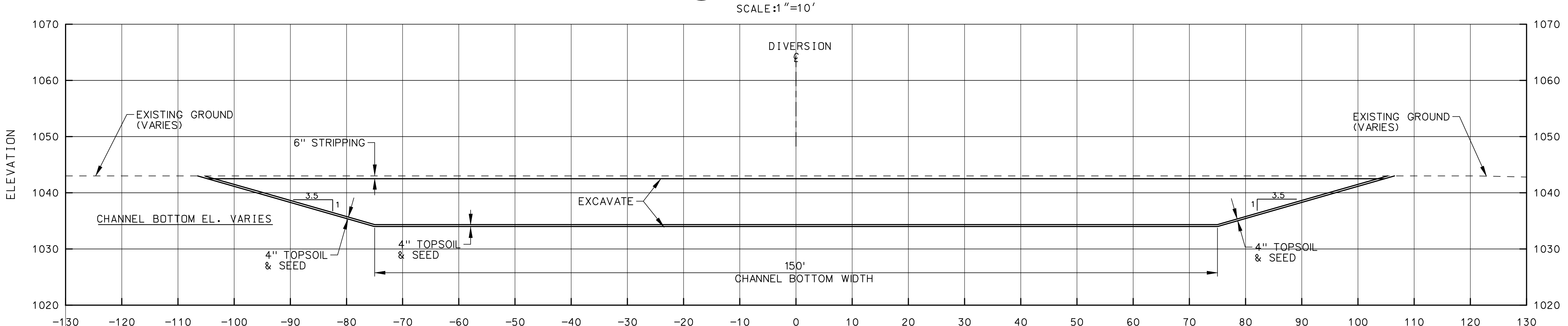
US Army Corps of Engineers
St. Paul District



1 TYPICAL SECTION

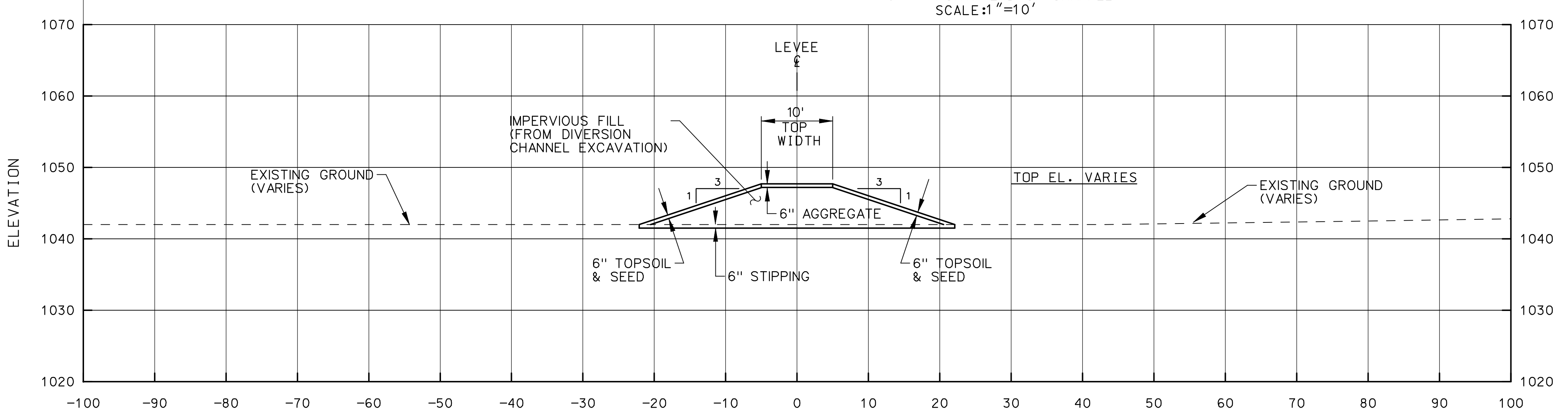
DIVERSION CHANNEL

SCALE:1"=10'



2 TYPICAL SECTION

DIVERSION CHANNEL-STEEP REACH
NORTH END OF CHANNEL
SCALE:1"=10'



3 TYPICAL SECTION

LEVEE

SCALE:1"=10'

DIVERSION NOTES:

1. DIVERSION BOTTOM WIDTH IS 150' FOR ENTIRE LENGTH, EXCEPT AT THE THREE BRIDGE LOCATIONS, WHERE THE CHANNEL BOTTOM NECKS TO A WIDTH OF 125'.

LEVEE NOTES:

1. ALL LEVEES HAVE SAME CROSS SECTION, EXCEPT FOR ROAD RAISE LEVEES. LEVEE HEIGHTS VARY.

US Army Corps of Engineers
St. Paul District

Symbol	Description	Date	Appr.

SCALE: AS SHOWN | DATE: AUG 05
CADD FILE NAME: RURC36461.DGN
SOL. NO: DACW37-01-B-0000
AE APPROVING OFFICIAL:
DESIGNED: JGS/GCW | CHECKED: XXX/XXX | DRAWN: GCW | DESIGNED: SMG | CHECKED: XXX/XXX
ED-D | ED-H

DEPARTMENT OF THE ARMY
ST. PAUL, MINNESOTA
CORPS OF ENGINEERS
ST. PAUL DISTRICT

ROSEAU FEASIBILITY STUDY
FLOOD CONTROL
CROSS SECTIONS

DRAWING NUMBER:
Plate 3
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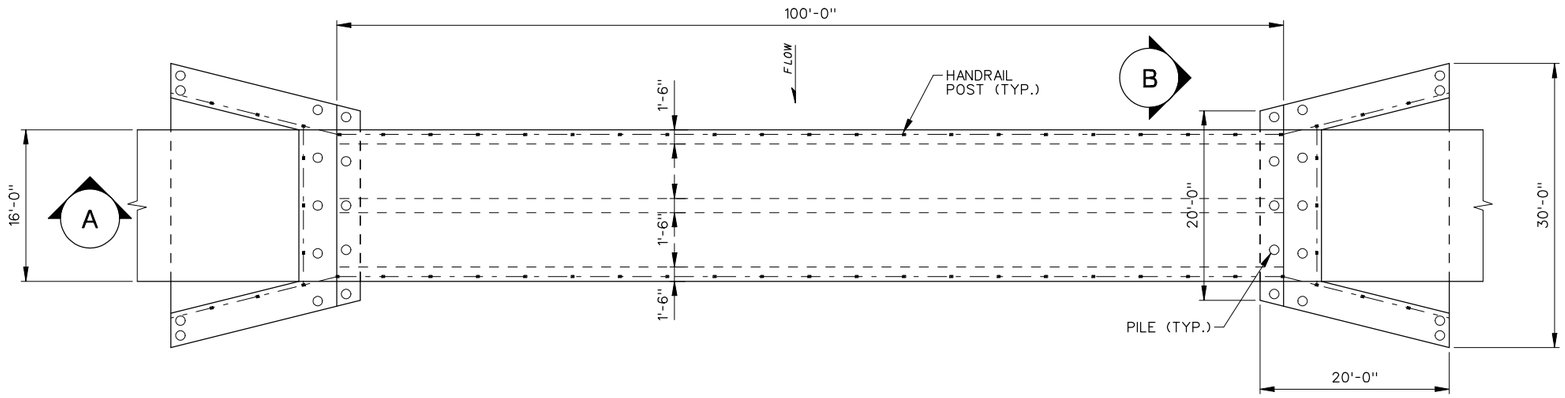
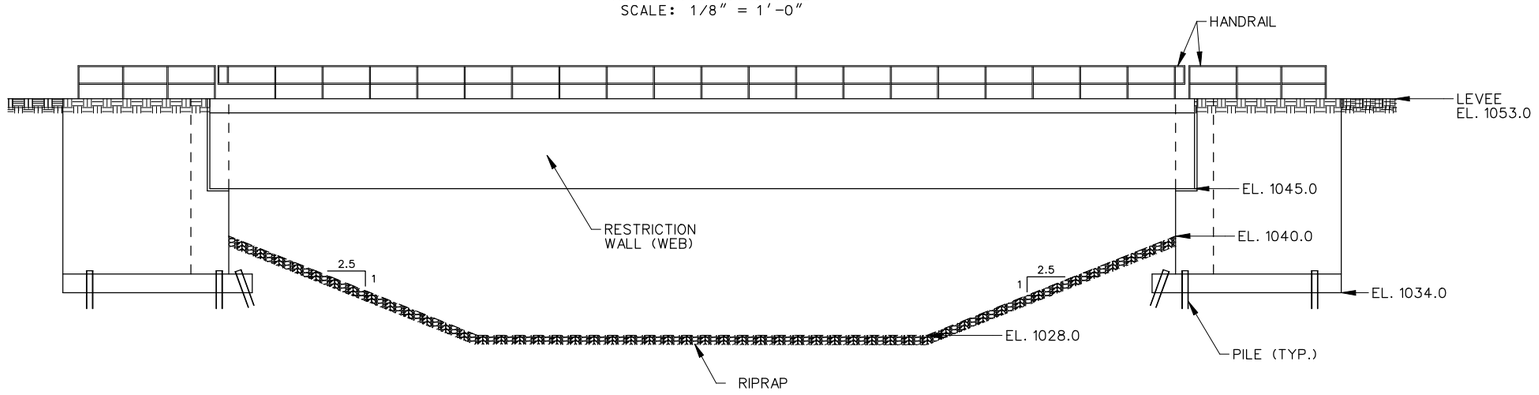


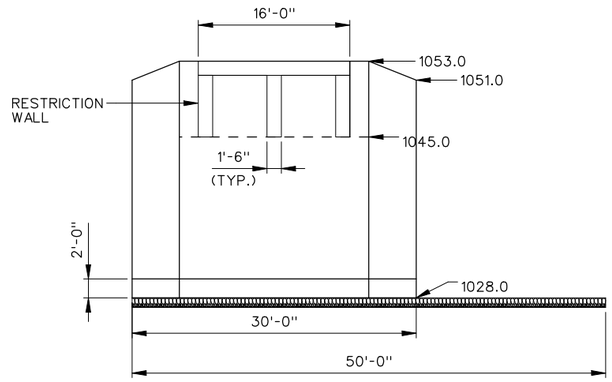
PLAN

RESTRICTION STRUCTURE
SCALE: 1/8" = 1'-0"



A SECTION

RESTRICTION STRUCTURE
SCALE: 1/8" = 1'-0"



B SECTION

RESTRICTION STRUCTURE
SCALE: 1/8" = 1'-0"

0 4' 8' 16'

US Army Corps of Engineers
St. Paul District

Symbol	Description	Date	Appr.

Designed by: TSF
Dwn by: NK
Ckd by: TSF
Date: 8 JUL 2005
Solicitation No.: DACW37-YR-B-0000
Rev.: XX
Authority: PROJECT AUTHORITY
Drawing Number: R-PR-P-CD/000
File Name: ROSEAU_RESTSTR
Plot Scale:
Plot Date:

DEPARTMENT OF THE ARMY
ST. PAUL DISTRICT
CORPS OF ENGINEERS
ST. PAUL, MINNESOTA

CONTRACT DRAWING
ROSEAU FEASIBILITY STUDY
ROSEAU RIVER
ROSEAU, MINNESOTA

FLOOD CONTROL
FEASIBILITY

Sheet reference number:
Plate 4
Sheet 3 of 3

Roseau Flood Reduction Project–East Diversion

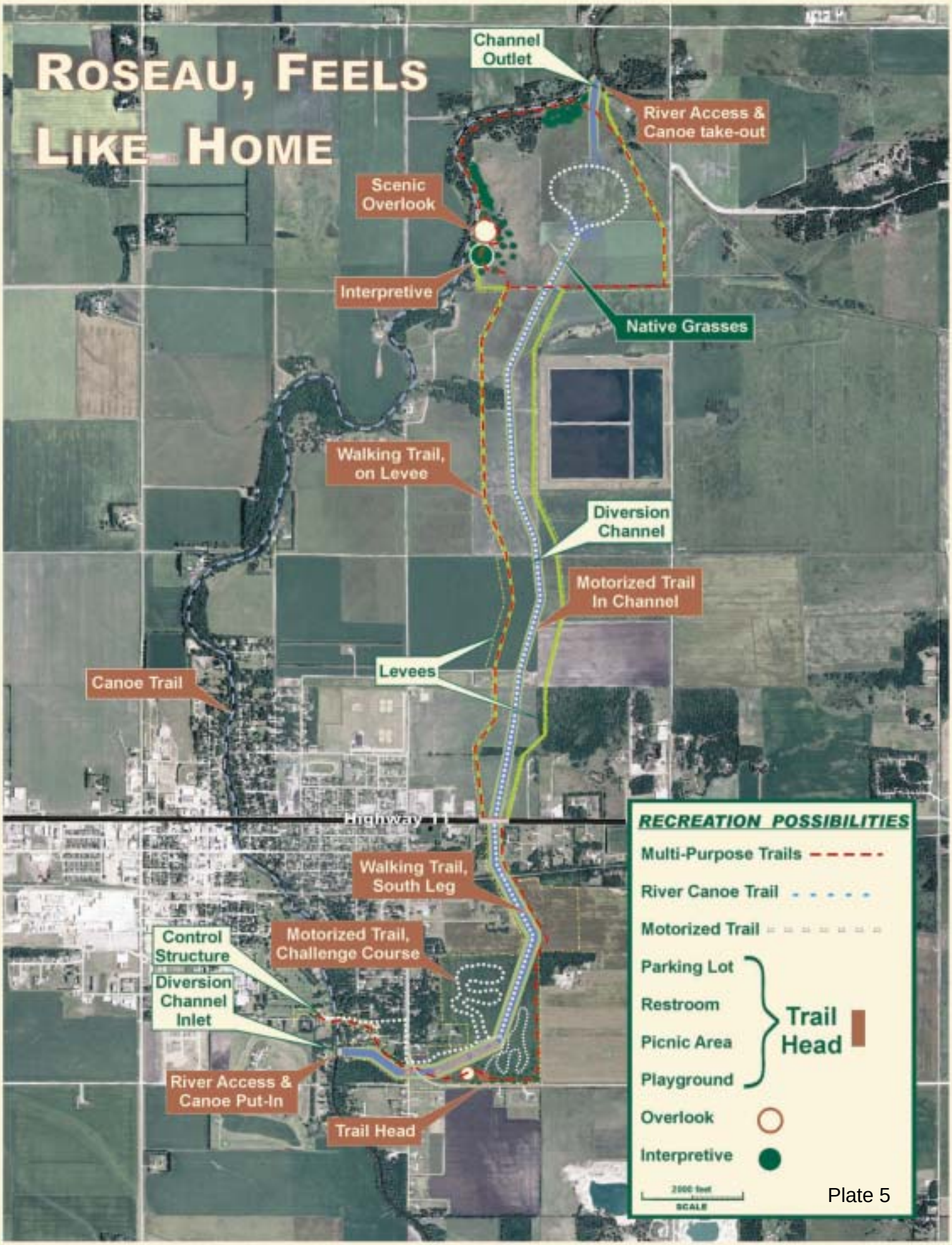
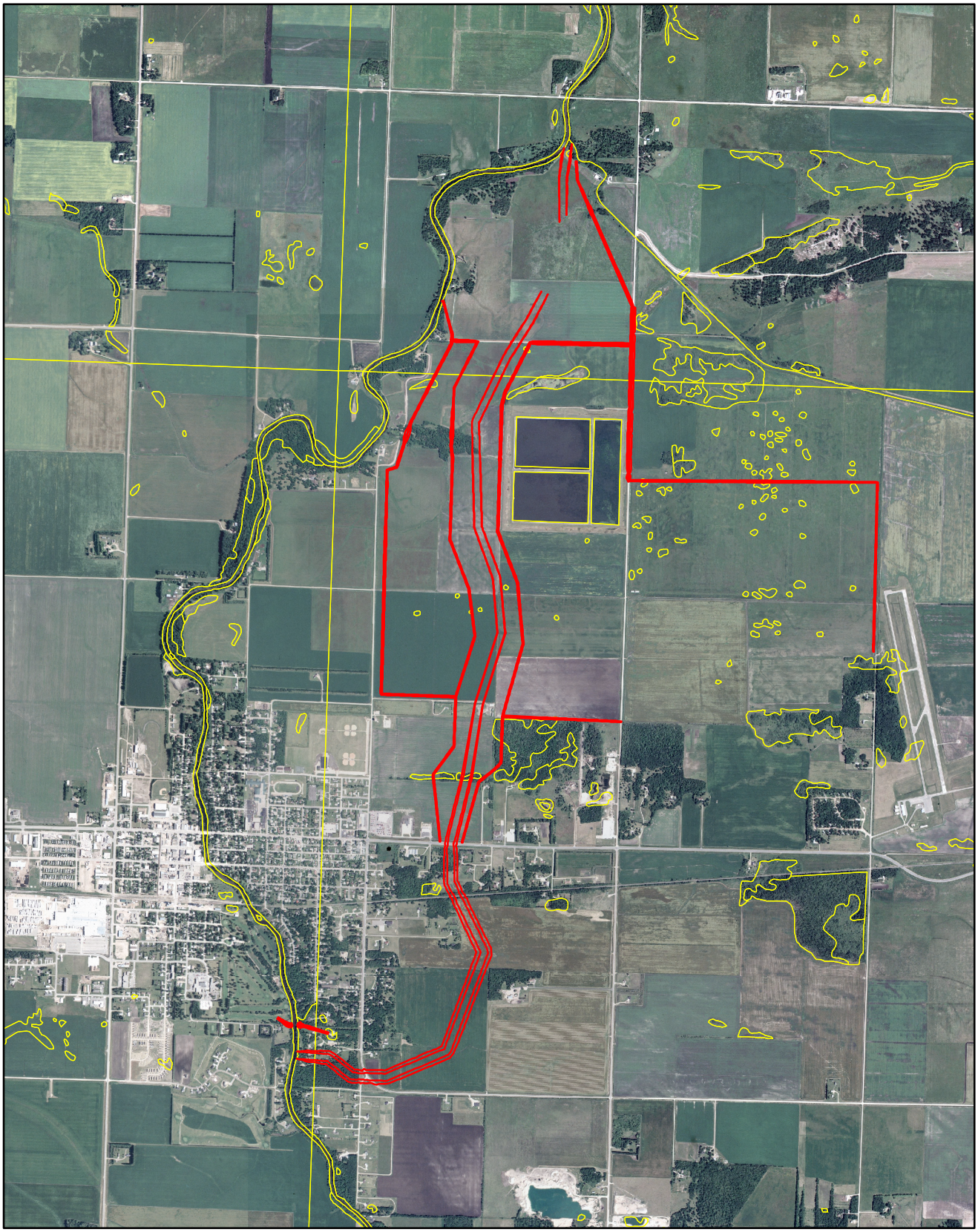


Plate 5



St. Paul District
ENVIRONMENTAL
US Army Corps of Engineers®

Plate 6 - Roseau Flood Control and Wetlands

0 1,500 3,000 6,000

Feet

Nat. Wetland Inv.

Project Features

X:\PM\ams\Roseau\Feasibility Report Documents\AFB Revisions\AFB Final Revisions\Roseau4